BLM LIBRARY
88067544

# Environmental Assessment

WSO LIBRARY

## Williams Telecomunications Company
## Fiber Optic Cable Project
## Cheyenne Junction to Los Angeles

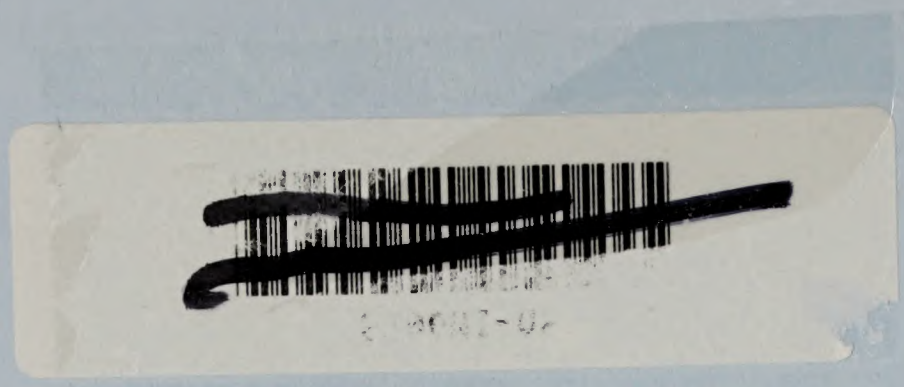
Prepared for

**USDI Bureau of Land Management**
**Salt Lake District Office**

Prepared by

**Woodward-Clyde Consultants**

June 1986



BUREAU OF LAND MANAGEMENT LIBRARY
BLDG. 50,
DENVER FEDERAL CENTER
P.O. BOX 25047
DENVER, COLORADO 80225

#15124290
D88067544

# Environmental Assessment

TD
195
.T3
W73
1986

# Williams Telecomunications Company Fiber Optic Cable Project

# Cheyenne Junction to Los Angeles

Prepared for

**USDI Bureau of Land Management**
**Salt Lake District Office**

Prepared by

**Woodward-Clyde Consultants**

June 1986

BUREAU OF LAND MANAGEMENT LIBRARY
BLDG. 50,
DENVER FEDERAL CENTER
P.O. BOX 25047
DENVER, COLORADO 80225

TABLE OF CONTENTS


| Section | | | Page |
|---|---|---|---|
| 1.0 | SUMMARY | | 1-1 |
| | 1.1 | Project Description | 1-1 |
| | 1.2 | Alternatives Considered | 1-2 |
| | 1.3 | Summary of Major Environmental Impacts of the Proposed Action and Alternatives | 1-2 |
| | | 1.3.1 Proposed Action | 1-2 |
| | | 1.3.1.1 Geology | 1-2 |
| | | 1.3.1.2 Soils and Reclamation | 1-2 |
| | | 1.3.1.3 Water Resources | 1-3 |
| | | 1.3.1.4 Vegetation, Livestock, Range, and Grazing Rates | 1-3 |
| | | 1.3.1.5 Wildlife | 1-4 |
| | | 1.3.1.6 Land Use | 1-4 |
| | | 1.3.1.7 Cultural Resources | 1-4 |
| | | 1.3.1.8 Socioeconomics | 1-5 |
| | | 1.3.1.9 Visual Resources | 1-5 |
| | | 1.3.2 Alternatives | 1-5 |
| | | 1.3.2.1 Mountain Bell Alternative | 1-5 |
| | | 1.3.2.2 CalNev Product Pipeline Alternative | 1-5 |
| | | 1.3.2.3 No-Action Alternative | 1-5 |
| 2.0 | DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES | | 2-1 |
| | 2.1 | Background | 2-1 |
| | 2.2 | Purpose and Need | 2-2 |
| | 2.3 | Proposed Action | 2-2 |
| | | 2.3.1 Route Description | 2-3 |
| | | 2.3.2 Land Requirements | 2-6 |
| | | 2.3.3 Project Components | 2-10 |
| | | 2.3.4 Preconstruction Activities | 2-16 |
| | | 2.3.5 Construction Methods | 2-18 |
| | | 2.3.6 Construction Schedule | 2-24 |
| | | 2.3.7 Construction Personnel and Equipment | 2-25 |
| | | 2.3.8 Applicant's Mitigation | 2-26 |
| | | 2.3.8.1 Cultural Resources | 2-27 |
| | | 2.3.8.2 Terrestrial Biology | 2-30 |
| | | 2.3.8.3 Aquatic Biology | 2-31 |
| | | 2.3.8.4 Air Quality | 2-32 |

TABLE OF CONTENTS
(continued)


| Section | | Page |
|---|---|---|
| | 2.3.8.5 Geology | 2-32 |
| | 2.3.8.6 Soils | 2-33 |
| | 2.3.8.7 Visual Resources | 2-34 |
| | 2.3.8.8 Water Resources | 2-35 |
| | 2.3.8.9 Land Use, Recreation, and Transportation | 2-36 |
| | 2.3.8.10 Noise | 2-37 |
| | 2.3.8.11 Public Monuments and Markers | 2-38 |
| | 2.3.8.12 Paleontological Resources | 2-38 |
| 2.3.9 | Compliance Check | 2-38 |
| 2.3.10 | Operation and Maintenance | 2-39 |
| 2.3.11 | Future Plans and Abandonment | 2-40 |
| 2.4 | Alternatives | 2-40 |
| 2.4.1 | Alternatives Assessed | 2-40 |
| | 2.4.1.1 Routing Alternatives | 2-40 |
| | 2.4.1.2 No-Action Alternative | 2-41 |
| 2.4.2 | Alternatives Eliminated from Further Analysis | 2-41 |
| | 2.4.2.1 Communication Systems | 2-41 |
| | 2.4.2.2 Routing Alternatives | 2-42 |
| 2.5 | Regulatory Compliance with Select Laws and Executive Orders | 2-49 |
| 3.0 | DESCRIPTION OF AFFECTED ENVIRONMENT | 3-1 |
| 3.1 | General Setting | 3-1 |
| 3.1.1 | Colorado | 3-1 |
| 3.1.2 | Wyoming | 3-2 |
| 3.1.3 | Utah | 3-3 |
| 3.1.4 | Nevada | 3-3 |
| 3.1.5 | California | 3-4 |
| 3.2 | Geology | 3-5 |
| 3.2.1 | Colorado | 3-5 |
| 3.2.2 | Wyoming | 3-5 |
| 3.2.3 | Utah | 3-6 |
| 3.2.4 | Nevada | 3-6 |
| 3.2.5 | California | 3-7 |

TABLE OF CONTENTS

(continued)


| Section | | Page |
|---|---|---|
| 3.3 | Soils and Reclamation | 3-7 |
| | 3.3.1 Colorado and Wyoming | 3-7 |
| | 3.3.2 Utah | 3-9 |
| | 3.3.3 Nevada | 3-11 |
| | 3.3.4 California | 3-12 |
| 3.4 | Water Resources | 3-14 |
| | 3.4.1 Colorado and Wyoming | 3-14 |
| | 3.4.2 Utah | 3-15 |
| | 3.4.3 Nevada | 3-15 |
| | 3.4.4 California | 3-15 |
| 3.5 | Vegetation, Livestock, Range, and Grazing Capacity | 3-16 |
| | 3.5.1 Colorado and Wyoming | 3-16 |
| | 3.5.2 Utah | 3-17 |
| | 3.5.3 Nevada | 3-19 |
| | 3.5.4 California | 3-21 |
| 3.6 | Wildlife | 3-25 |
| | 3.6.1 Colorado | 3-25 |
| | 3.6.2 Wyoming | 3-25 |
| | 3.6.3 Utah | 3-32 |
| | 3.6.4 Nevada | 3-34 |
| | 3.6.5 California | 3-35 |
| 3.7 | Land Use | 3-37 |
| | 3.7.1 Colorado | 3-37 |
| | 3.7.2 Wyoming | 3-37 |
| | 3.7.3 Utah | 3-38 |
| | 3.7.4 Nevada | 3-39 |
| | 3.7.5 California | 3-39 |
| 3.8 | Cultural Resources | 3-40 |
| | 3.8.1 Northwestern Plains | 3-41 |
| | 3.8.2 Great Basin | 3-42 |
| | 3.8.3 California | 3-44 |
| 3.9 | Socioeconomics | 3-46 |
| | 3.9.1 Colorado | 3-46 |
| | 3.9.2 Wyoming | 3-46 |
| | 3.9.3 Utah | 3-48 |
| | 3.9.4 Nevada | 3-48 |
| | 3.9.5 California | 3-48 |

WSO LIBRARY

TABLE OF CONTENTS
(continued)


| Section | | Page |
|---|---|---|
| 3.10 | Visual Resources | 3-49 |
| | 3.10.1 Colorado | 3-49 |
| | 3.10.2 Wyoming | 3-49 |
| | 3.10.3 Utah | 3-52 |
| | 3.10.4 Nevada | 3-53 |
| | 3.10.5 California | 3-53 |
| 3.11 | Paleontology | 3-54 |
| | 3.11.1 Wyoming | 3-54 |
| | 3.11.2 California | 3-55 |
| 4.0 | ENVIRONMENTAL IMPACTS | 4-1 |
| 4.1 | Proposed Action | 4-2 |
| | 4.1.1 Geology | 4-2 |
| | 4.1.2 Soils and Reclamation | 4-2 |
| | 4.1.3 Water Resources | 4-5 |
| | 4.1.4 Vegetation, Livestock, Range, and Grazing Rates | 4-6 |
| | 4.1.5 Wildlife | 4-8 |
| | 4.1.6 Land Use | 4-12 |
| | 4.1.7 Cultural Resources | 4-13 |
| | 4.1.8 Socioeconomics | 4-15 |
| | 4.1.9 Visual Resources | 4-17 |
| | 4.1.10 Paleontology | 4-18 |
| 4.2 | Mountain Bell Alternative | 4-18 |
| | 4.2.1 Soils and Reclamation | 4-18 |
| | 4.2.2 Vegetation, Livestock, Range, and Grazing Rates | 4-18 |
| | 4.2.3 Visual Resources | 4-18 |
| 4.3 | CalNev Alternative | 4-18 |
| | 4.3.1 Vegetation, Livestock, Range, and Grazing Rates | 4-18 |
| 5.0 | CONSULTATION AND COORDINATION | 5-1 |
| 5.1 | Agencies and Organizations Consulted | 5-1 |
| | 5.1.1 Federal | 5-1 |
| | 5.1.2 State | 5-2 |
| | 5.1.3 Local | 5-3 |
| 5.2 | List of Preparers | 5-4 |

WSO LIBRARY

TABLE OF CONTENTS
(continued)


| Section | | Page |
|---|---|---|
| 6.0 | BIBLIOGRAPHY | 6-1 |
| APPENDIX A | SOILS AND EROSION CONTROL MEASURES | A-1 |
| APPENDIX B | VISUAL RESOURCE MANAGEMENT CLASSIFICATIONS | B-1 |
| APPENDIX C | WETLANDS CROSSED BY THE RIGHT-OF-WAY | C-1 |
| APPENDIX D | RIVERS, CREEKS, AND DRAINAGES CROSSED BY THE PROJECT RIGHT-OF-WAY | D-1 |
| APPENDIX E | GEOLOGIC HAZARDS TABLE | E-1 |
| APPENDIX F | PROJECT ROUTE MAPS | F-1 |
| APPENDIX G | GUIDELINES FOR THE PREPARATION OF THE CULTURAL RESOURCE INVENTORY CLASS I REPORT | G-1 |
| APPENDIX H | LAND USE CATEGORIES CROSSED BY OR ADJACENT TO THE PROPOSED ROUTE | H-1 |
| APPENDIX I | TRANSMISION LINES AND ACCESS ROADS | I-1 |

FIGURES


| Figure | | Page |
|---|---|---|
| 2.3-1 | LOCATION OF PROPOSED ROUTE | 2-4 |
| 2.3-2 | TYPICAL RIGHT-OF-WAY USE DURING CONSTRUCTION | 2-8 |
| 2.3-3 | TYPICAL FIBER OPTIC CABLE | 2-11 |
| 2.3-4 | HANDHOLE (SPLICE BOX) INSTALLATION | 2-12 |
| 2.3-5 | LAYOUT OF A TYPICAL REGENERATOR STATION | 2-14 |
| 2.3-6 | TYPICAL REGENERATOR STATION BUILDING | 2-15 |
| 2.3-7 | CABLE PLOW | 2-19 |
| 2.3-8 | TYPICAL CROSS SECTION FOR TRENCH BURIAL | 2-22 |
| 2.3-9 | TYPICAL CROSS SECTION OF STREAM OR DRAINAGE CROSSING (TRENCHED OR PLOWED) | 2-23 |

TABLES


| Table | | Page |
|---|---|---|
| 2.3-1 | SUMMARY OF PROPOSED ROUTE | 2-5 |
| 2.3-2 | OWNERSHIP OF LAND TRAVERSED BY THE PROPOSED ACTION | 2-7 |
| 2.4-1 | OWNERSHIP OF LAND TRAVERSED BY THE ALTERNATIVES | 2-43 |
| 2.5-1 | SUMMARY OF POTENTIAL FEDERAL PERMITS AND AUTHORIZATIONS REQUIRED FOR THE PROPOSED PROJECT | 2-51 |
| 2.5-2 | SUMMARY OF POTENTIAL MAJOR STATE PERMITS REQUIRED FOR THE PROPOSED PROJECT | 2-53 |
| 3.5-1 | SPECIAL STATUS PLANT SPECIES POTENTIALLY OCCURRING NEAR THE PROPOSED ROUTE (NEVADA) | 3-20 |
| 3.5-2 | SPECIAL STATUS PLANT SPECIES POTENTIALLY OCCURRING NEAR THE PROPOSED ROUTE (CALIFORNIA) | 3-23 |
| 3.5-3 | SPECIAL STATUS PLANT SPECIES POTENTIALLY OCCURRING NEAR THE ALTERNATIVE ROUTE IN CALIFORNIA | 3-26 |
| 3.6-1 | SPORTFISH OCCURRING IN WYOMING STREAMS CROSSED BY THE PROPOSED CABLE ROUTE | 3-29 |
| 3.6-2 | SPORTFISH OCCURRING IN UTAH STREAMS CROSSED BY THE PROPOSED CABLE ROUTE | 3-33 |
| 3.10-1 | VISUAL RESOURCE MANAGEMENT CLASSES FOR BUREAU OF LAND MANAGEMENT LANDS | 3-50 |
| 3.10-2 | VISUAL QUALITY OBJECTIVES FOR U.S. FOREST SERVICE LANDS | 3-51 |

# 1.0 SUMMARY

## 1.1 PROJECT DESCRIPTION

Williams Telecommunications Company (the Applicant) is proposing to construct a fiber optic telecommunications cable and associated facilities from the northwest border of Colorado and Wyoming to Los Angeles, California. The system would have the capacity to provide service to and connect with existing telecommunication systems in Cheyenne, Wyoming; Salt Lake City, Utah; Las Vegas, Nevada; and Los Angeles, California. The entire 1166-mile-long fiber optic system would be buried in, or adjacent to, existing pipeline, buried cable, and road rights-of-way. Major project features would include a 3/4-inch-diameter, 12-pair fiber optic cable buried to a maximum depth of four feet below ground level, above-ground regenerator stations 10 x 16 x 9-feet in size with a rock/sandstone surfaced exterior, junction stations similar to the regenerator stations but larger 10 x 24-foot buildings, and several short segments of above-ground transmission lines to serve regenerator stations. Most of the cable would be buried with a cable plow. Cable construction would begin in July 1986 and would take approximately six months to complete. The BLM would issue a right-of-way grant with a 10-foot permanent right-of-way and a temporary use permit for an additional 10-foot construction strip. The United States Forest Service would issue a Special Use Permit for construction and operation on National Forest Lands. Existing rights-of-way and road systems would be used for access during both construction and operation.

## 1.2 ALTERNATIVES CONSIDERED

Alternatives identified and assessed in the environmental assessment (EA) process included two routing alternatives and a No-Action alternative. The Mountain Bell alternative would follow the existing Mountain Bell communication (cable) line across southern Wyoming to a point near Evanston, Wyoming. The CalNev Products Pipeline alternative would follow the CalNev Pipeline Company right-of-way from Las Vegas, Nevada, to Victorville, California. If no action were taken, the right-of-way grant would not be issued, and Williams Telecommunications would not install the cable along the selected route. There would be no other impacts associated with the No-Action alternative.

The applicants proposed routing alternative is preferred by the Bureau of Land Management and the United States Forest Service.

## 1.3 SUMMARY OF MAJOR ENVIRONMENTAL IMPACTS OF THE PROPOSED ACTION AND ALTERNATIVES

### 1.3.1 Proposed Action

The major findings of the impact analysis for each resource topic evaluated in the EA are given below.

1.3.1.1 Geology. Over the major part of the route in Colorado, Wyoming, and Nevada, grading and clearing would not be required, landslide potentials are low, and placement of the cable within or adjacent to existing rights-of-way would not affect slope stability.

1.3.1.2 Soils and Reclamation. Soil disturbance in plowed sections would be limited to a 6- to 8-inch-wide plowed area. Equipment movement would be expected to crush existing vegetation but not significantly affect soil structure or compaction. Additional disturbance would occur where trenching is required or where dozer blading would be necessary to

allow plow movement. Areas requiring rock sawing would be subject to similar levels of disturbance as for those requiring trenching. Trenching and blading impacts would be mitigated by measures specified in Appendix A, Plans of Development, and Special Use Permits to construct and operate.

New soil disturbance would be limited by location of the line within already-disturbed pipeline rights-of-way. Soil structure or other characteristics are not expected to be significantly altered by either plowing or equipment track compaction, except in wet areas which would be mitigated by measures specified in Appendix A.

1.3.1.3 Water Resources. Based on the Applicant's proposed methods of stream crossings, long-term impacts to water resources would not be expected to occur. Short-term decreases in water quality due to increased sediment loads could occur due to disturbance of the streambed and channel during crossings. However, the increase in sediment loads would decrease to pre-construction levels following completion of construction and any necessary reclamation measures.

1.3.1.4 Vegetation, Livestock, Range, and Grazing Rates. Equipment used to install the cable would crush most vegetation within an 8-foot width and remove all vegetation within the plow/trench line. Clearing and grading should not be necessary in the remaining construction right-of-way, and removal of trees and brush would be minimal. The most common construction technique would consist of plowing the cable into the ground, which would cause vegetation removal in a narrow 6-inch-wide zone. Vegetation on either side (approximately 8 feet wide) would be crushed under the treads of tires of the construction vehicles but should recover since the root systems would be intact. Greater disturbance of vegetation within the right-of-way would occur in areas where trenching is required (up to 3 feet wide), and in small areas at road, river, and railroad crossings, regenerator stations, and splice boxes. The total

area of vegetation impact along the cable route would be approximately 1122 acres.

No impacts would occur to any listed or proposed, threatened or endangered plant species or to critical habitat.

1.3.1.5 Wildlife. Installation and operation of the cable would not result in significant impacts to big game, raptors, and upland game. Although the proposed cable rights-of-way is within the distribution range of several listed or proposed endangered and threatened species (black-footed ferret, peregrine falcon, bald eagle, Wyoming toad, and Least Bell's vireo), the proposed construction and installation would not have any adverse or unavoidable impacts due to Applicant-committed practices detailed in Section 2.0 and mitigation that will be included in Plans of Development and/or Notices to Proceed for each BLM District Office and in construction/operation plans for the USFS. Installation of the cable at stream crossings would cause a short-term increase in the turbidity levels in perennial streams. These short-term increases in turbidity are not expected to significantly affect fishery resources.

1.3.1.6 Land Use. Construction and operation of the proposed cable would not have significant impacts on existing land uses along the right-of-way. The construction and operation of the cable would be either in conformance with or would not conflict with the overall objectives of all pertinent existing BLM and USFS land use plans, according to BLM and USFS personnel contacted and review of all applicable management framework plans and grazing environment impact statements.

1.3.1.7 Cultural Resources. The Applicant has committed to the measures listed in Section 2.0 for cultural resources. These measures would prevent the loss or physical disturbance of cultural resources during construction. In addition, unauthorized collecting of artifacts during

project construction and operation would be restricted, and measures would be taken to prevent identified sites from becoming public knowledge.

1.3.1.8 Socioeconomics. Based on the small number of construction workers, the number of cities along the route and their associated accommodations and services available to the workers, no socioeconomic impacts are expected.

1.3.1.9 Visual Resources. The project components, due to their size and dimensions and their locations within landscapes not considered to be unique or outstanding, would not contrast significantly with characteristic landscapes and therefore would conform with the Visual Resources Management Classes.

1.3.2 Alternatives

1.3.2.1 Mountain Bell Alternative. The Mountain Bell alternative would involve approximately 10 additional miles of soil and vegetation disturbance. Impacts to both of these resources would be similar to those of the proposed action.

1.3.2.2 CalNev Product Pipeline Alternative. The CalNev alternative would involve an additional 16 acres of vegetation disturbance. Impacts would be similar to vegetation impacts along the rest of the route.

1.3.2.3 No-Action Alternative. If no action were taken, the right-of-way grant would not be issued, and Williams Telecommunications would not install the cable along the proposed route. There would be no other impacts associated with the no-action alternative.

# 2.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

## 2.1 BACKGROUND

Williams Telecommunications Company (the Applicant) is a facilities-based carrier providing long-distance and interexchange transmission services. The Applicant currently operates facilities in Illinois, Iowa, Missouri, and Nebraska, and plans to expand into Minnesota. Williams Telecommunications Company is a member of the National Telecommunications Network (NTN), a consortium of seven regional telecommunications companies.

The primary objective and business plan of the Applicant is to expand its role as a facilities-based carrier by construction of an interstate transmission system from the midwestern United States to the west coast. The west coast expansion and current facilities would connect with the National Telecommunications Network, and with local exchanges. The west coast expansion project would provide interexchange transmission services for common carrier telecommunications companies, and would also provide a private communications system for organizations affiliated with the Applicant.

The proposed project would consist of the construction of a fiber optic cable and associated facilities from the Cheyenne junction in Colorado to Los Angeles, California. The system would have the capacity to provide service to and connect with existing telecommunication systems in Cheyenne, Wyoming; Salt Lake City, Utah; Las Vegas, Nevada; and Los Angeles, California. The entire 1166-mile-long fiber optic system will be buried in, or adjacent to, existing pipeline, railroad, buried cable, and road rights-of-way.

The following project description describes: the need and purpose of the project; a description of the route; land requirements; project components; construction methods and mitigation; and an analysis of the alternatives considered in developing the project.

## 2.2 PURPOSE AND NEED

The purpose of the proposed project is to provide additional capacity and an alternative means of telecommunication service to the west coast and the cities mentioned in the introduction. As a result of the divestiture of American Telephone and Telegraph (AT&T) in 1984 and a series of rulings by the Federal Communications Commission (FCC), the U.S. market for nationwide interstate long-distance telephone service has become intensely competitive. Common carriers other than AT&T have been given improved access to the public network that had previously been the domain of AT&T. The proposed construction would consist of approximately 1166 miles of 3/4-inch-diameter fiber optic cable placed within or adjacent to existing pipeline, railroad, buried cable, and road rights-of-way. Ancillary facilities would consist of regenerator stations and several short segments of transmission line, junction stations, and terminals. The proposed expansion would enable the Applicant to provide a capacity of 405/565 megabits/second on each of 12 fiber pairs, to other common carriers at the terminals, as well as at intermediate service points along the system.

## 2.3 PROPOSED ACTION

Pursuant to Title V of the Federal Land Policy and Management Act (FLPMA), the Applicant has applied to the BLM for a right-of-way grant to bury a fiber optic telecommunications cable. The BLM would issue the Applicant a 10-ft right-of-way grant for those portions of the cable on lands administered by the BLM. The BLM would also issue a temporary use permit for an additional 10-ft construction strip adjacent to the right-of-way. Plans of development will be prepared for BLM districts in the states of Utah and Wyoming. Construction in each BLM district would

be allowed after a notice to proceed has been finalized for each respective district.

The authorization process on National Forest lands would be a four-step process:

- Land use authorization application
- Analysis, evaluation, and EA documentation
- Special Use Permit and Decision Notice (approval or non-approval)
- Approval
  - Construction, operation, and maintenance plans
  - Issuance of land use authorizations

### 2.3.1 Route Description

The location of the proposed route and alternative routes are indicated in Figure 2.3-1 and detailed maps of the route are provided in Appendix F. The proposed route is described below and the alternative routes are described in Section 2.4.2. The proposed cable would extend from the Cheyenne junction in Colorado to Los Angeles, passing near or through Cheyenne, Salt Lake City, and Las Vegas. The route would be approximately 1166 miles long and would pass through portions of Colorado, Wyoming, Utah, Nevada, and California.

Routing considerations included the views of local, state, and federal agency personnel. The cable route would primarily utilize existing rights-of-way throughout its length. The main rights-of-way to be used between cities are indicated in Table 2.3-1. Laterals into cities or routes through cities may utilize a variety of potential access routes, including utility corridors, leased ductwork, abandoned sewers, or other pipelines, railroads, and public roads.

The cable route from the Cheyenne junction in Colorado to Rawlins, Wyoming, would be within the Northwest Central Pipeline System

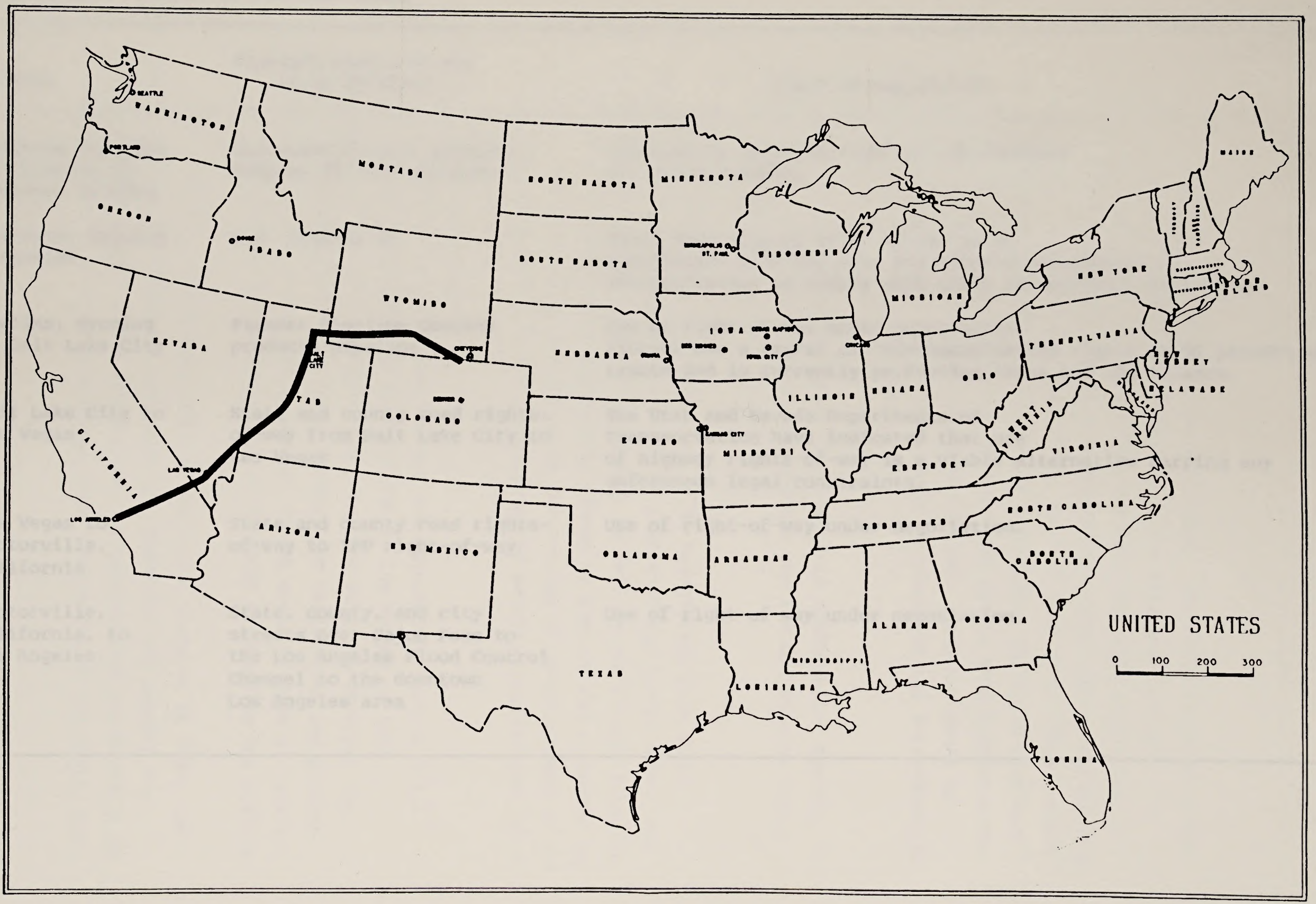



Figure 2.3-1. LOCATION OF PROPOSED ROUTE

Table 2.3-1. SUMMARY OF PROPOSED ROUTE

| Section | Existing Rights-of-Way to Be Utilized | Right-of-Way Status |
|---|---|---|
| Cheyenne junction in Colorado to Rawlins, Wyoming | Northwest Central Pipeline Company 20-inch pipeline | Applicant's existing right-of-way easement are being amended. |
| Cheyenne, Wyoming, Lateral | U.S. Highway 85 | Final selection of right-of-way to be coordinated with Colorado and Wyoming Departments of Transportation to comply with their respective preferences. |
| Rawlins, Wyoming to Salt Lake City | Pioneer Pipeline Company products pipeline | Use of right-of-way under negotiation. Pioneer has a degree of telecommunication rights on 90 percent of tracts and is currently perfecting these and the balance. |
| Salt Lake City to Las Vegas | State and county road rights-of-way from Salt Lake City to Las Vegas | The Utah and Nevada Departments of Transportation have indicated that use of highway rights-of-way is a viable alternative barring any unforeseen legal constraints. |
| Las Vegas to Victorville, California | State and county road rights-of-way to IPP right-of-way | Use of right-of-way under negotiation. |
| Victorville, California, to Los Angeles | State, county, and city streets over Cajon Pass to the Los Angeles Flood Control Channel to the downtown Los Angeles area | Use of right-of-way under negotiation. |

right-of-way, an affiliate of the Applicant. The cable would be plowed into the ground about 10 to 25 feet from the existing pipeline. Similarly, the cable between Rawlins and Salt Lake City would also be plowed into the Pioneer Pipeline right-of-way, except for a segment from a point just east of Weber Pass, Utah, to Salt Lake City. That segment would be constructed using a trenching technique. The route from Salt Lake City to Las Vegas would follow state and county road rights-of-way and would be plowed into the road right-of-way. From Las Vegas to Victorville, California, the cable would be plowed in the Inter-Mountain Power Project (IPP) right-of-way.

From Victorville, over Cajon Pass, and into downtown Los Angeles, the right-of-way would include various roadways and the Los Angeles County Flood Control Channel.

The Applicant has approached and is in negotiation with other companies and state agencies for use of rights-of-way listed here. For pipelines affiliated with the Applicant, as well as the Pioneer Pipeline, there are existing telecommunications rights on some of the easements on private land, and the Applicant is in the process of amending some of the remaining easements to permit installation of a telecommunications cable.

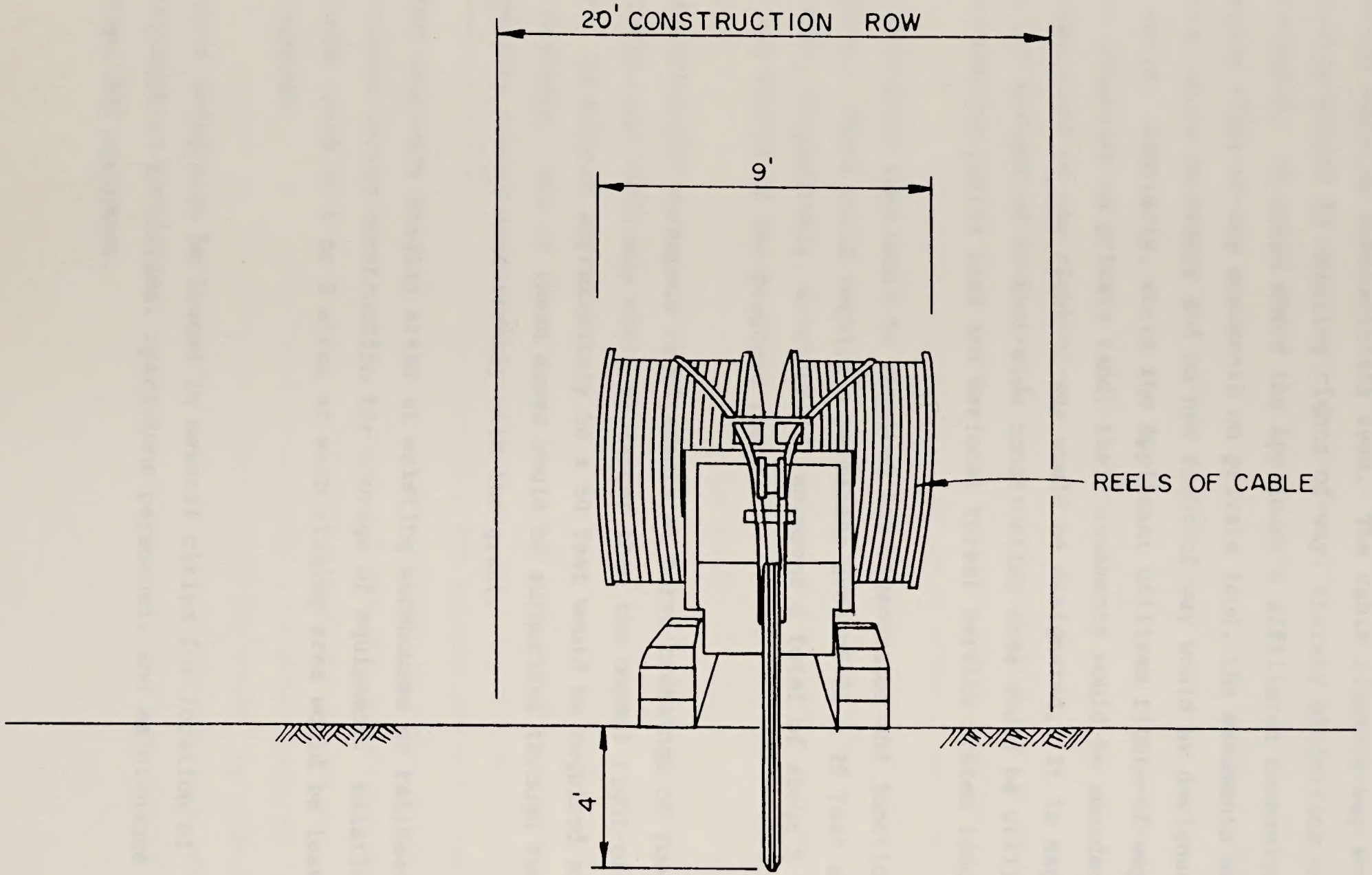
### 2.3.2 Land Requirements

The fiber optic cable right-of-way and regenerator station sites would include land under the jurisdiction of the Bureau of Land Management; U.S. Forest Service; U.S. Fish and Wildlife Service; the states of Colorado, Wyoming, Utah, Nevada, and California; and private owners. Table 2.3-2 provides a summary of the areas of federal, state, county, and private lands that would be directly affected by the project.

The permanent operational right-of-way width would be 10 feet. An additional 10 feet would be requested (by temporary use permit) for construction. Figure 2.3-2 illustrates how construction can normally be confined within a 20-foot-wide area. Over the length of the route, the

Table 2.3-2. OWNERSHIP OF LAND TRAVERSED BY THE PROPOSED ACTION

| | BLM (Miles) | State or Private (Miles) | National Forest System Lands (Miles) | National Wildlife Refuge (Miles) | Military (Miles) |
|---|---|---|---|---|---|
| Colorado | 0 | 9 | 0 | 0 | 0 |
| Wyoming | 104 | 247 | 0 | 0 | 0 |
| Utah | 84 | 279 | 3 | 0 | 2 |
| Nevada | 109 | 95 | 0 | <1 | 0 |
| California | 105 | 111 | 5 | 0 | 0 |




(NOT TO SCALE)

TYPICAL RIGHT-OF-WAY USE
DURING CONSTRUCTION

**Woodward-Clyde Consultants**

Figure 2.3-2

right-of-way area would utilize about 2845 acres during construction and 1423 acres during operation. The actual area disturbed during construction is expected to be less than this; the area permanently affected would be substantially less. The cable right-of-way would be generally placed in existing rights-of-way, thereby minimizing new land disturbance. In areas where the Applicant's affiliated companies have existing right-of-way easements on private land, the easements would be amended where necessary and no new right-of-way would be designated for the cable. Similarly, where the Applicant utilizes rights-of-way of other companies on private land, their easements would be amended if necessary and no new right-of-way would be designated. It is expected that the designated 20-foot-wide construction area would be utilized only when crossing public land and National Forest Service System lands.

Additional land would be required for regenerator and junction stations. These would require a permanent area of 20 x 25 feet and 50 x 100 feet, respectively, which would represent a total of about 5 acres over the length of the proposed route.

Construction workspace requirements at bored crossings of roads, aqueducts, and railroads would be larger than the normal right-of-way width. An area of approximately 50 x 50 feet would be required at each such crossing. Use of these areas would be authorized through Temporary Use permits issued concurrently with the grant.

Ten temporary staging areas at existing warehouses or railheads would be required during construction for storage of equipment. Existing warehouse space of 1 to 2 acres at each staging area would be leased for this purpose.

Space would also be leased in several cities for location of interconnection facilities, operations personnel, and maintenance personnel and equipment.

2.3.3 Project Components

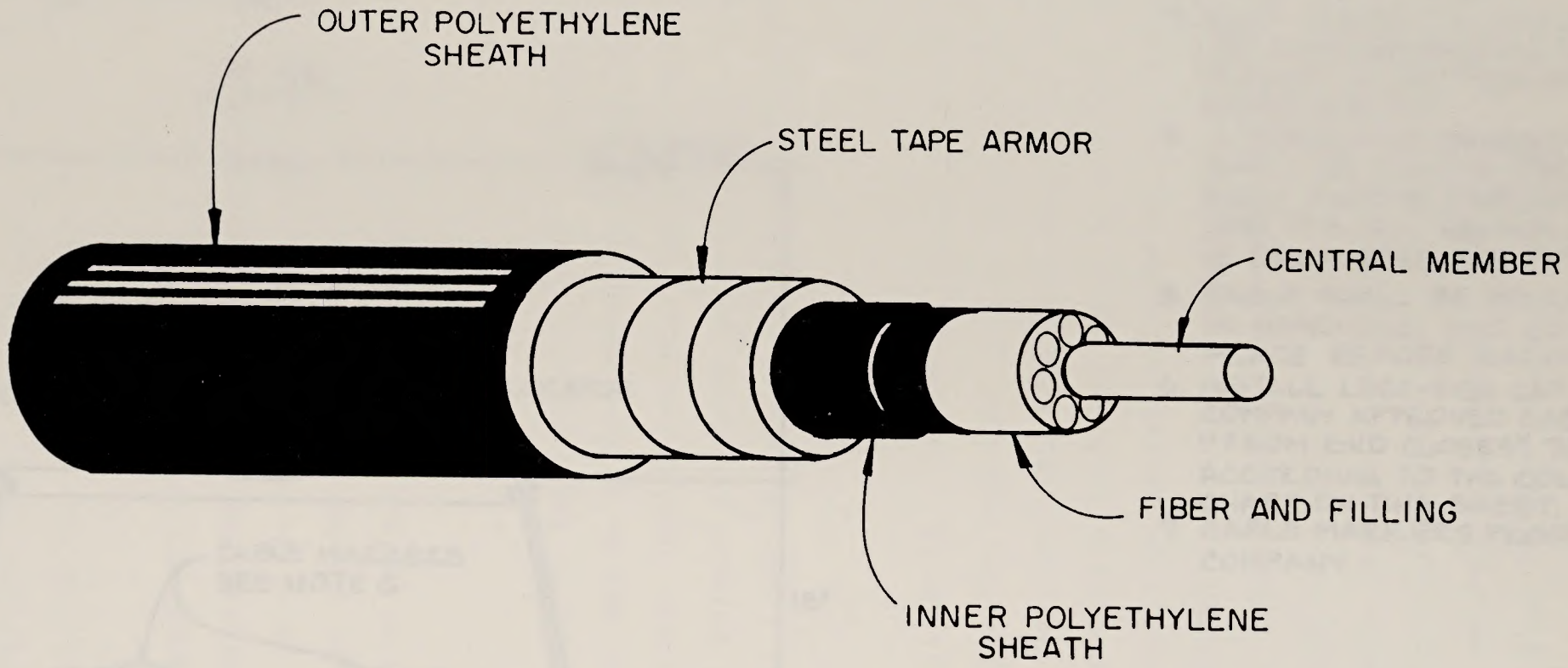
The fiber optic cable project would include the following components:

- Approximately 1166 miles of fiber optic cable
- Regenerator stations at approximately 25-mile intervals
- Terminal facilities (Points of Presence) in serviced cities
- Short segments of power distribution lines for power supply at some regenerator location (Appendix I)

Each of these components is described below.

A 3/4-inch-diameter, 12-pair fiber optic cable would be utilized. Figure 2.3-3 shows a cross section of a sample cable, indicating the steel central member (for strength), the optic fibers, the steel sheathing (for protection from rodents), and the external polyethylene sheathing. Suitable cable is produced by several manufacturers. The cable would be buried to a maximum depth of 4 feet below ground level where possible along the route. In areas of shallow soil, the cable may be placed closer to the surface. Under roads, in urban areas, and where the cable would go through existing pipeline, the cable would be placed in 2- or 4-inch PVC or steel conduit.

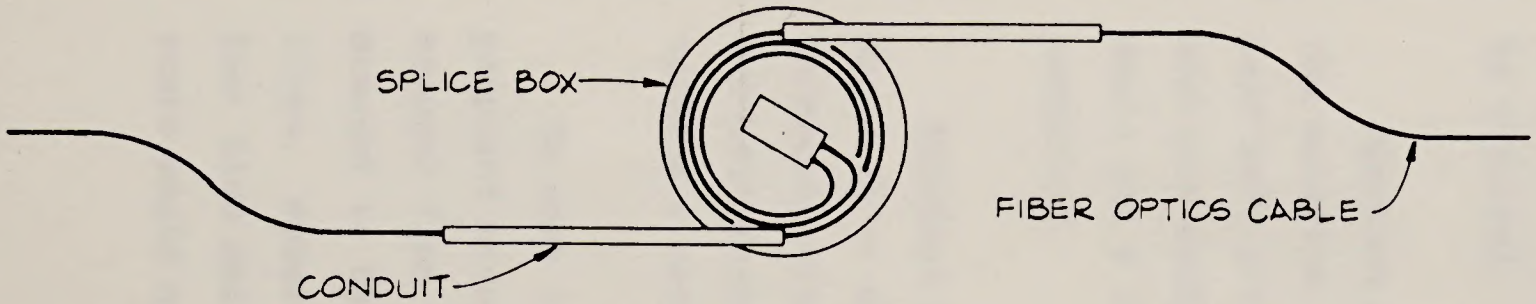
Fiber optic cable is produced in 3- and 6-kilometer lengths. Splices are required between adjacent sections of cable to provide continuous transmission. A total of approximately 390 splices would be required. Splices would be protected from mechanical damage by being placed in splice cases. Further protection would be provided by placing the splice cases within a prefabricated 3 x 3 x 4-foot concrete splice vault (pull box) (Figure 2.3-4). Additional pull boxes with extra loops of cable would be placed on each side of rivers and major roads, to enable quicker repair in case of a break. The steel central member and steel sheath would be bonded and grounded at each splice case using an 8-foot metal rod.



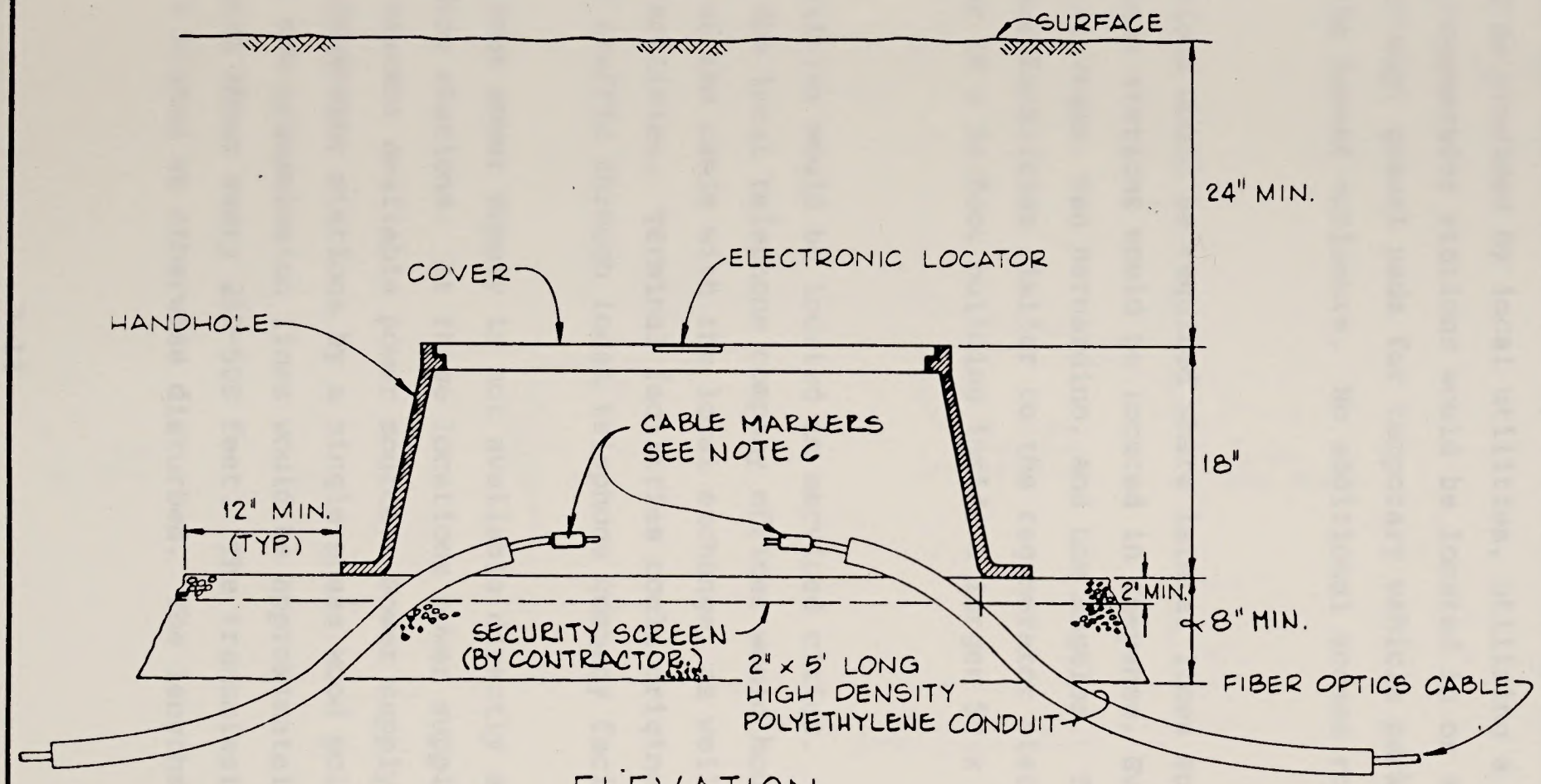

TYPICAL FIBER OPTIC CABLE

**Woodward-Clyde Consultants**

Figure 2.3-3




PLAN




ELEVATION

NOTES

1. MINIMUM 30' OF SLACK LEFT IN EACH HANDHOLE
2. MAXIMUM BEND RADIUS OF CABLE EQUALS 15 INCHES
3. EIGHT INCHES MIN. OF PEA GRAVEL (¼" AVERAGE SIZE) SHALL BE PLACED IN BOTTOM OF THE HANDHOLE PIT.
4. A THREE-WIRE, BARBED WIRE FENCE SHALL BE CONSTRUCTED AROUND EACH HANDHOLE/SPLICE BOX PIT AND IT SHALL REMAIN UNTIL SPLICE IS COMPLETED AND PIT IS BACKFILLED
5. CABLE SHALL BE SPLICED, COILED IN HANDHOLE, AND COVERS IN PLACE BEFORE BACKFILLING
6. INSTALL LEGI-SIGN CAT. NO. UT-321 OR COMPANY APPROVED CABLE MARKERS 1' FROM END CLOSEST TO CONDUIT ACCORDING TO THE COLOR & WORDING CHART ON THIS SHEET.
7. CABLE MARKERS PROVIDED BY COMPANY.

CABLE MARKERS
COLORING & WORDING

YELLOW - FROM N. OR E. - MAIN CABLE
BLUE - TO S. OR W. - MAIN CABLE

| ISSUE NUMBER | DRAWN BY | DATE REVISED | CHECKED BY | PROJECT ENGINEER | SECTION HEAD | APPROVED BY |
|---|---|---|---|---|---|---|
| 1 | ISSUED FOR STANDARD S.A. | 5-1-86 | W.H.D. | 5-5-86 | | |

LEADER IN DIGITAL COMMUNICATIONS

| | | |
|---|---|---|
| DRAWN BY | S.A.J. | 5-1-86 |
| CHECKED BY | W.H.D. | 5-5-86 |
| PROJECT ENGINEER | | |
| SECTION HEAD | | |
| APPROVED BY | | |

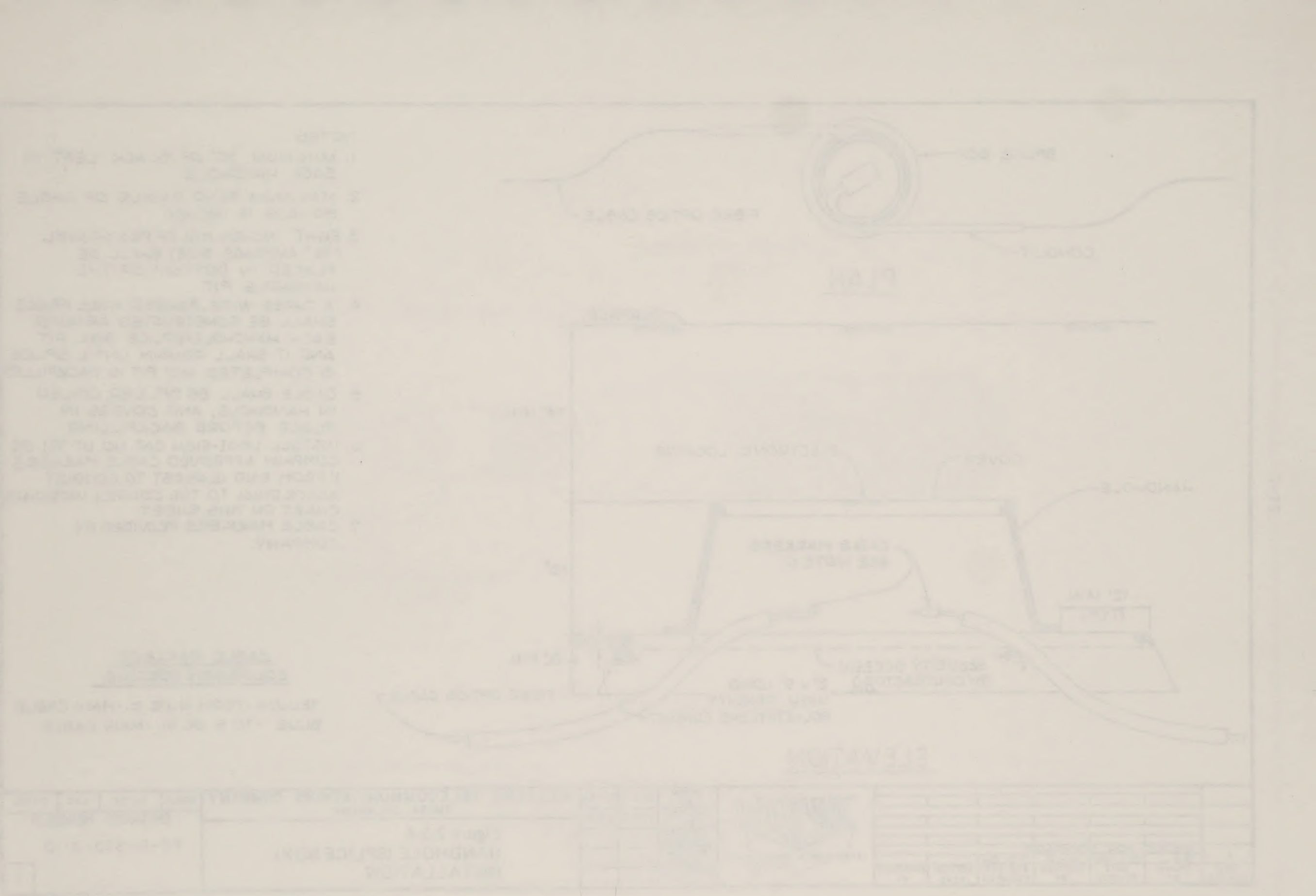
WILLIAMS TELECOMMUNICATIONS COMPANY
TULSA, OKLAHOMA

Figure 2.3-4
HANDHOLE (SPLICE BOX)
INSTALLATION

| SCALE | NONE | AFE. | 0480 |
|---|---|---|---|

DRAWING NUMBER
FO-B-STD-S-10

1

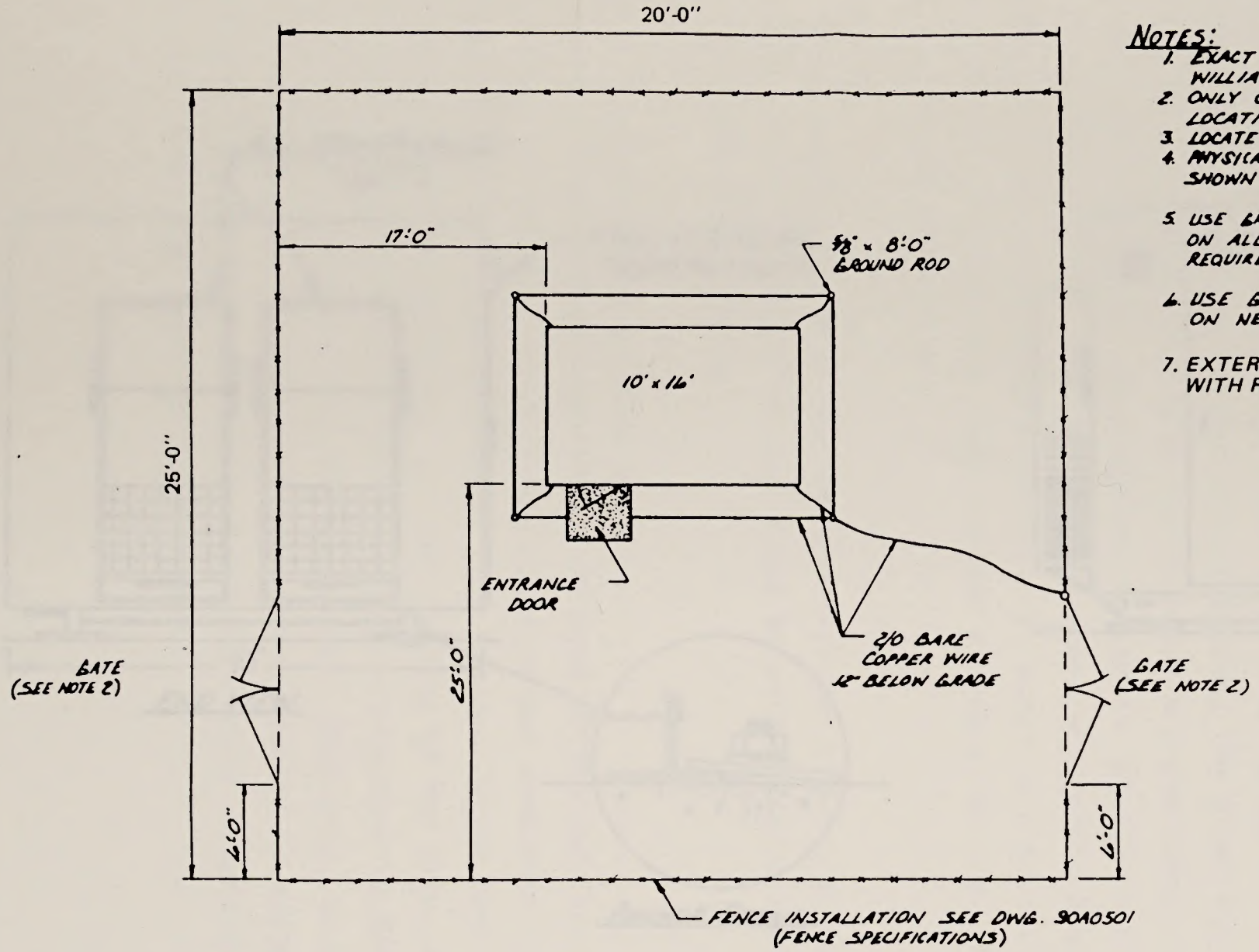


Regenerator stations would be used to regenerate the signal at roughly 25-mile intervals. Each would consist of a 10 x 16 x 9-foot building with a rock/sandstone surfaced exterior within a 20 x 25-foot fenced enclosure. The layout of a typical regenerator station site is shown in Figure 2.3-5, and a representative photograph of the building is provided in Figure 2.3-6. The building would contain optical regenerator equipment, 48-volt batteries, and battery chargers. The building would be air conditioned and would be heated by electric strip heaters. Electricity would be provided by local utilities, utilizing a 220-V line. Since the regenerator stations would be located in or adjacent to existing rights-of-way, gravel pads for temporary vehicle parking may be provided inside the fenced enclosure. No additional access roads would be required.

Junction stations would be required where lateral lines split from the mainline. These stations would be located in Cheyenne, Evanston, Salt Lake City, Las Vegas, San Bernardino, and Los Angeles. These stations would have facilities similar to the regenerator station, but would use a larger 10 x 24-foot building inside a larger 50 x 100-foot enclosure.

Terminal facilities would be located in serviced cities. Leased space in or near the local telephone company offices would house the interconnections of the cable with the local exchange, as well as office and maintenance facilities. Terminal facilities could originate and terminate network traffic through local telephone company facilities.

In some locations power supply is not available directly adjacent to proposed regenerator stations. At these locations power supply would be brought from the nearest available power source. Power supply would be brought to the regenerator stations by a single-phase wood pole power lines. Poles for new transmission lines would be approximately 30-40 feet high and spaced about every 250-500 feet. The transmission line route would not be bladed or otherwise disturbed. The lengths of new



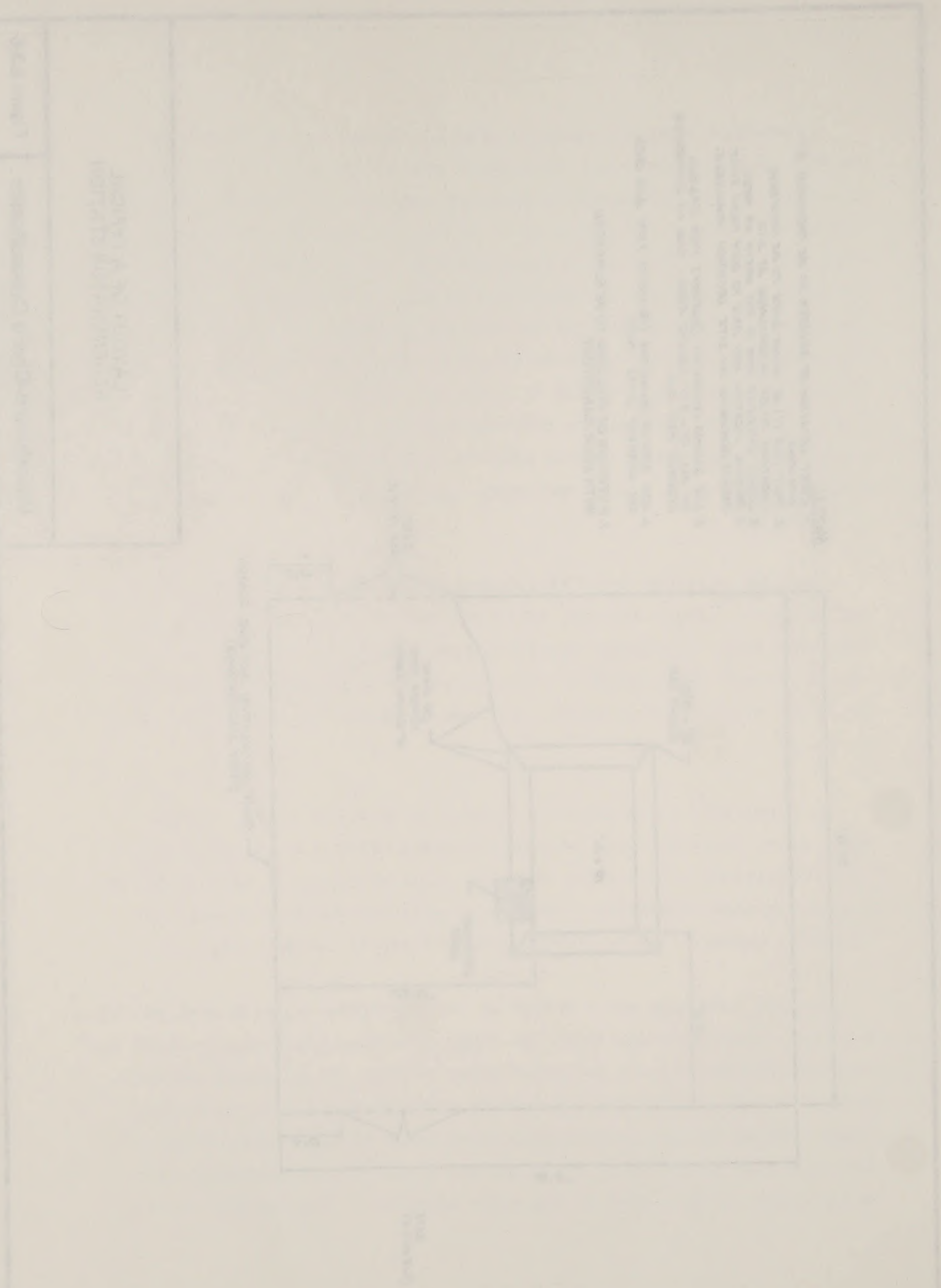

NOTES:

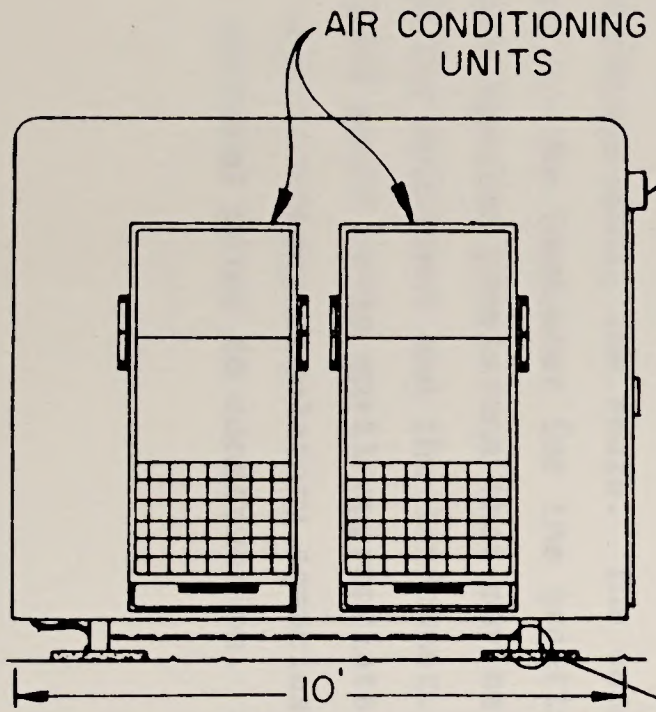
1. EXACT LOCATION OF SHELTER TO BE PROVIDED BY WILLIAMS.
2. ONLY ONE (1) 12' DRIVE GATE TO BE PROVIDED, LOCATION TO BE DETERMINED AT SITE.
3. LOCATE ENTRANCE DOOR TO THE NORTH OR WEST.
4. PHYSICAL LOCATION MAY HAVE TO VARY FROM THAT SHOWN DEPENDING ON SITE LOCATION AVAILABLE.
5. USE GROUND CONNECTOR (BURNDY) TYPE GP6426 ON ALL 5/8" x 8'-0" GROUND RODS. ONE (1) CONNECTOR REQUIRED PER ROD.
6. USE GROUND CONNECTOR (BURNDY) TYPE BAR 1926 ON NEAREST GATE POST.
7. EXTERIOR OF BUILDING TO BE SURFACED WITH ROCK/SANDSTONE

LAYOUT OF A TYPICAL
REGENERATOR STATION

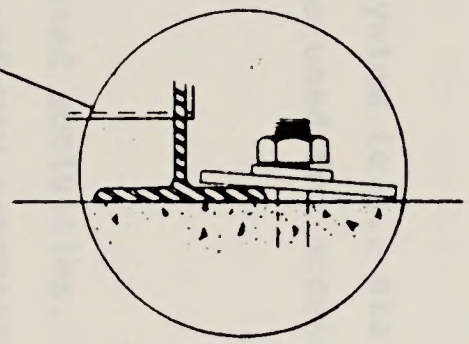
**Woodward-Clyde Consultants**

Figure 2.3-5

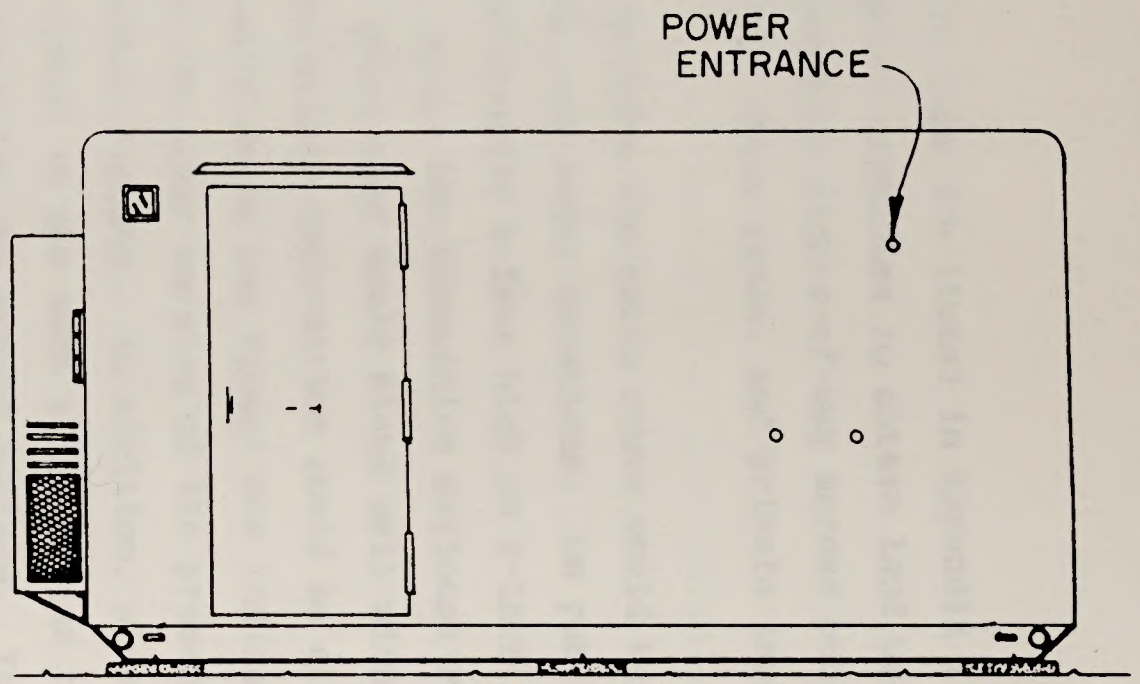





END VIEW



ANCHOR DETAIL

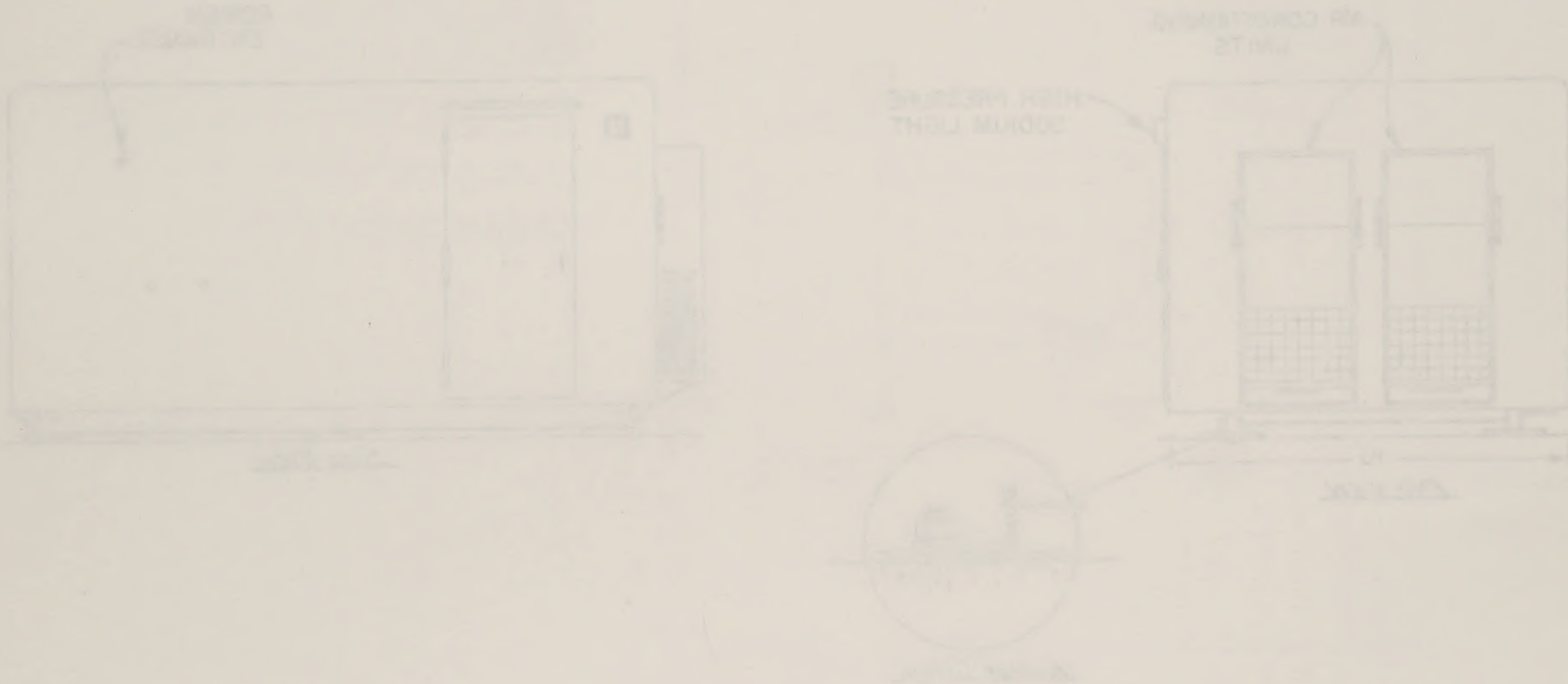



SIDE VIEW

TYPICAL REGENERATOR
STATION BUILDING

**Woodward-Clyde Consultants**

Figure 2.3-6



transmission line are listed in Appendix I (Table I-1). There will be a need for power companies to obtain land use authorizations or easements for new powerline rights-of-way across public lands, National Forest System lands, state lands, and private lands.

Signs marking the cable route would be placed at road crossings, fence lines, and other locations. On public lands, signs would be orange, and mounted 6 feet high on 4-inch polyethylene pipes. In certain locations, e.g., San Bernardino National Forest-Cajon Pass area, posts of a type of metal that would blend well with surrounding features would be used. Appropriate information would be etched/engraved on them. Messages would be of two types: one indicating the direction of the cable, and the other warning of its presence and providing a phone number to call before digging. In addition, a metallic plastic ribbon tape would be placed in the same alignment as the cable approximately 2 nominal feet below the ground surface. It would be placed during the cable-laying operation and would contain a message warning of the presence of an optic cable.

The existing rights-of-way and road system (e.g., state and county roads, and utility rights-of-way) would be used for access during both construction and operation).

### 2.3.4 Preconstruction Activities

Prior to initiating construction-related activities, the Applicant would survey the route and purchase right-of-way easements from the private landowners along the route. The easement would provide for compensation to the landowner for the granting of the right-of-way and would contain special provisions that may be necessary to address the concerns of the Applicant and the landowner. Similarly, no construction on public land would begin until appropriate permits or easements were obtained. All necessary regulatory agencies would be contacted for permits or approval prior to construction.

The Applicant's project manager would work with individual BLM and Forest Service districts to notify all potentially affected owners, tenants, and lessees of private land and the lessees of public lands, in advance of initiating construction activities on their respective properties. All potentially affected permit holders or ranchers who could be working in the right-of-way vicinity during cable installation periods would also be notified by the Applicant. Prior arrangements would be made with ranchers and farmers with respect to routes of ingress and egress, and the location of livestock. Arrangements would also be made prior to disruption of any highway or road traffic.

The Applicant would also notify all other grant holders with cables or pipelines that would be crossed by the fiber optic cable and would hire a blue stake company to locate existing rights-of-way along the proposed route. Grant holders would be cooperated with fully in order to avoid any potential conflicts.

The Applicant would submit detailed Plans of Development, as requested by specific BLM districts, along the project route. If necessary, mitigations in the Plans of Development would be supplemented by more specific stipulations to mitigate potential adverse actions. In addition, detailed stipulations for mitigation of site-specific impacts for all BLM districts along the route would be covered in the Notice to Proceed prior to construction and included in the Plans of Development. The Applicant would provide each BLM district office with names of authorized company representatives who would be on-site with the contractor during field work.

Special use permits are required by the three National Forests that would be traversed by the proposed route: Wasatch-Cache, Medicine Bow, and the San Bernardino National Forests. All necessary site specific mitigations and/or stipulations would be included in the permit conditions. Specifically, the appropriate USFS fire plan will be adopted for each special use permit.

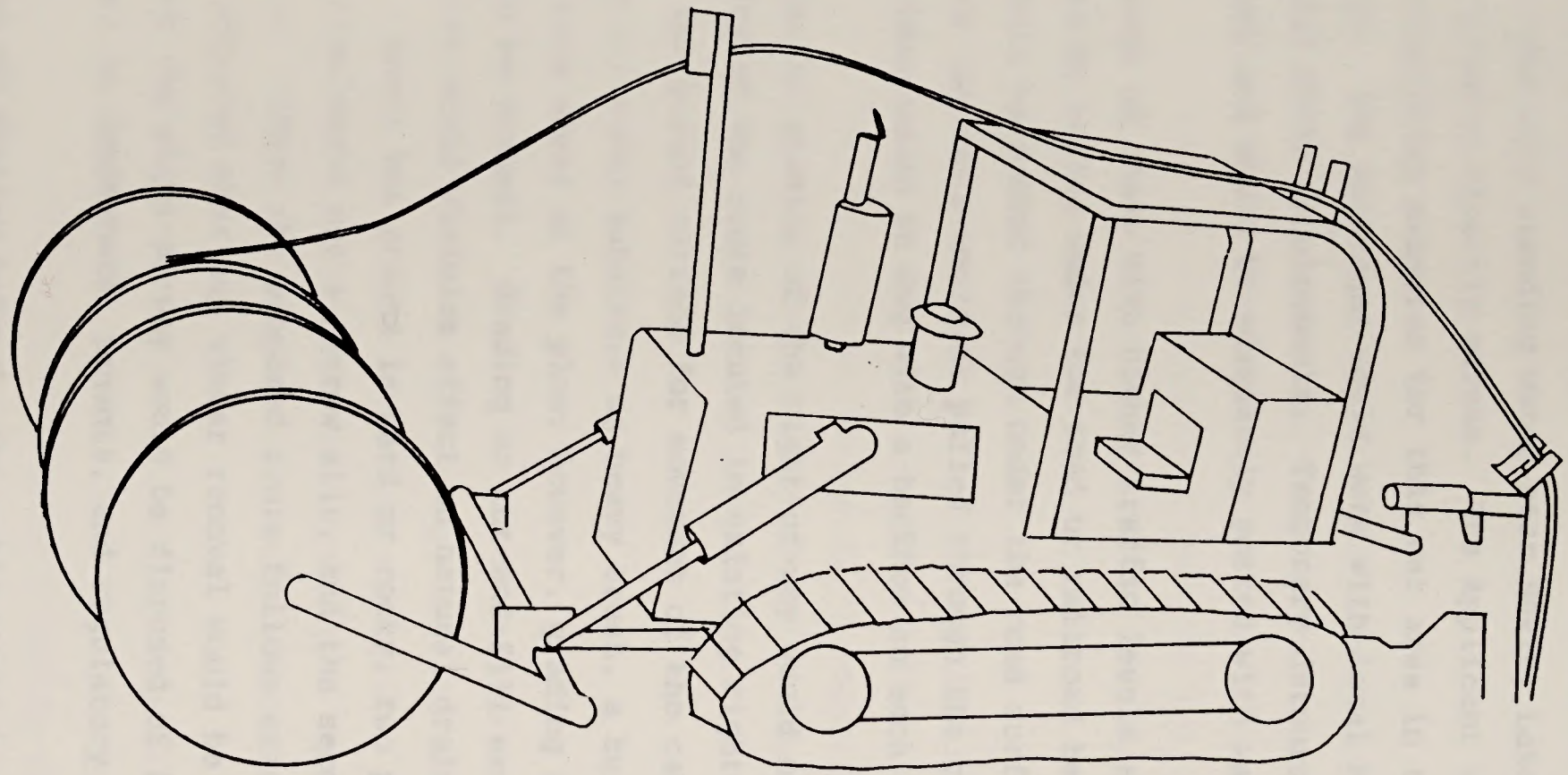
Other preconstruction activities include preparation of construction engineering specifications and drawings, purchase of materials, and scheduling and hiring of contractors. Separate contracts would be let out for each segment of the cable, and for the regenerator station installation and splicing. Each contractor would be educated regarding Applicant-committed mitigation measures.

### 2.3.5 Construction Methods

The normal method of cable placement would be plowing, using a cable plow to place the cable at a depth of 4 feet. A cable plow (Figure 2.3-7) is a specialized piece of machinery which simultaneously breaks a narrow strip of ground and lays the cable deep in the ground. This is also known as split-trenching, because the ground is split open rather than dug. The soil is not turned over or removed and the only direct disturbance is the narrow strip from the 2-inch-wide plow blade. If a raised ridge is left, it may be compacted to original grade by running a vehicle over the strip.

In congested urban areas plowing is not efficient, and the normal construction technique would be trenching. A trencher (ditch witch) would be used to cut a narrow slot 4 feet deep and 4-8 inches wide, and the cable would be threaded through 2-inch-diameter conduit placed at the bottom. Trenching may also be used as necessary in other areas. The trench would be backfilled with the removed material and the surface would be restored.

Existing pipelines would be located and staked prior to ditching, trenching, or digging activities. Also, other buried facilities, such as water lines, cables, and gas distribution lines would be marked to prevent accidental interruption of services. In all areas, all existing underground utility locating services would be utilized.



CABLE PLOW

**Woodward-Clyde Consultants**

Figure 2.3-7

Crossings of minor roads, small perennial or ephemeral creeks, and irrigations ditches would usually be made by plowing directly across, followed by restoration of the road surface, creek, or ditch bank. A low-lying area with standing water near Sevier Lake, Utah, would also be crosed by plowing directly across. The Applicant will include any special restoration measures for this wet area in the applicable Plan of Development. The Applicant would work with local highway engineers and would follow their requirements. Temporary detours would be constructed as necessary and would be adequately posted with warning signs.

Crossings of roads with higher traffic levels and railroads would be constructed by boring under the road or railroad bed. A 4-inch-diameter conduit would be pushed through under the road surface at a depth of 4 feet, and the cable would be pulled through the conduit. A pit for the boring machine would be dug with a backhoe on each side of each crossing.

Clearing or grading of the right-of-way would not be required for the majority of the route located in existing right-of-way. If required to smooth the ground surface for movement of the cable plow through rough terrain, e.g., rocky substrate or heavy brush, a bulldozer may blade the ground surface ahead of the plow; however, grading requirements are expected to be minimal. Grading or cut-and-fill excavating would be done in a way that would minimize effect on natural drainage and slope stability. Where the ground is hard or rocky, two plows would be used. The first plow would rip a narrow slit, and the second plow would knife in the cable. Since the proposed route follows existing right-of-way, it is not anticipated that any timber removal would be required. All debris removed from the right-of-way would be disposed of in a manner satisfactory to landowners, tenants, and regulatory agencies.

In areas of shallow bedrock, the cable would be laid at a shallower depth, but no shallower than 18 inches. Where rock is at the surface, a narrow trench in the rock would be cut with a rock-cutting chainsaw and the cable would be cemented into place. No blasting would be required.

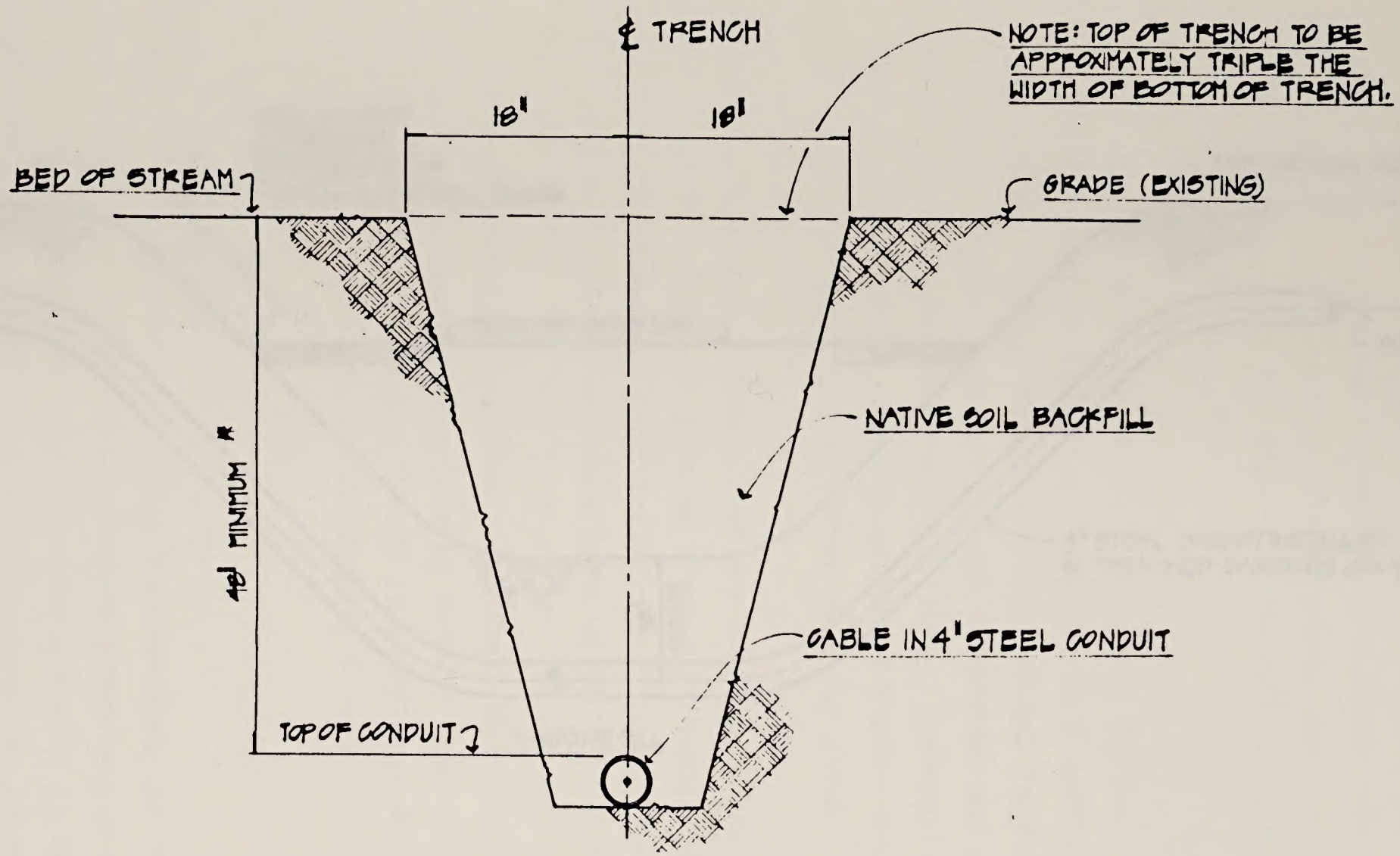
Although not anticipated, if the proposed action results in the introduction of noxious weeds, the preferred method of control will be the application of a herbicide. Application must be preceded by written approval by the BLM and completion of appropriate environmental documentation.

Rivers would be crossed using three primary techniques. Where bridges are available, the cable would be run through carrier conduit. In most cases -- i.e., ditches, intermittent streams and small perennial streams -- the cable would be plowed into the bottom of the channel. In larger rivers or where the river bottom is too rocky to plow, the cable may be trenched (backhoe) through the streambed.

Where streams were crossed by trenching, all banks and streambeds would be immediately returned to original contours. Disturbed areas along stream banks would be protected by riprapping and/or reseeding as required by federal land management agencies (Figures 2.3-8 and 2.3-9). All backfill in streambeds would consist of native fill. Conduit would be placed in the trench location, and the fiber optic cable would then be pulled through the conduit.

Crossing techniques would be selected according to engineering considerations, regulatory requirements, and the unique features of each situation where a crossing would be necessitated. No diversion structures would be required for any crossing. Crossings of canals and aqueducts would use existing bridges, suspension, or boring.

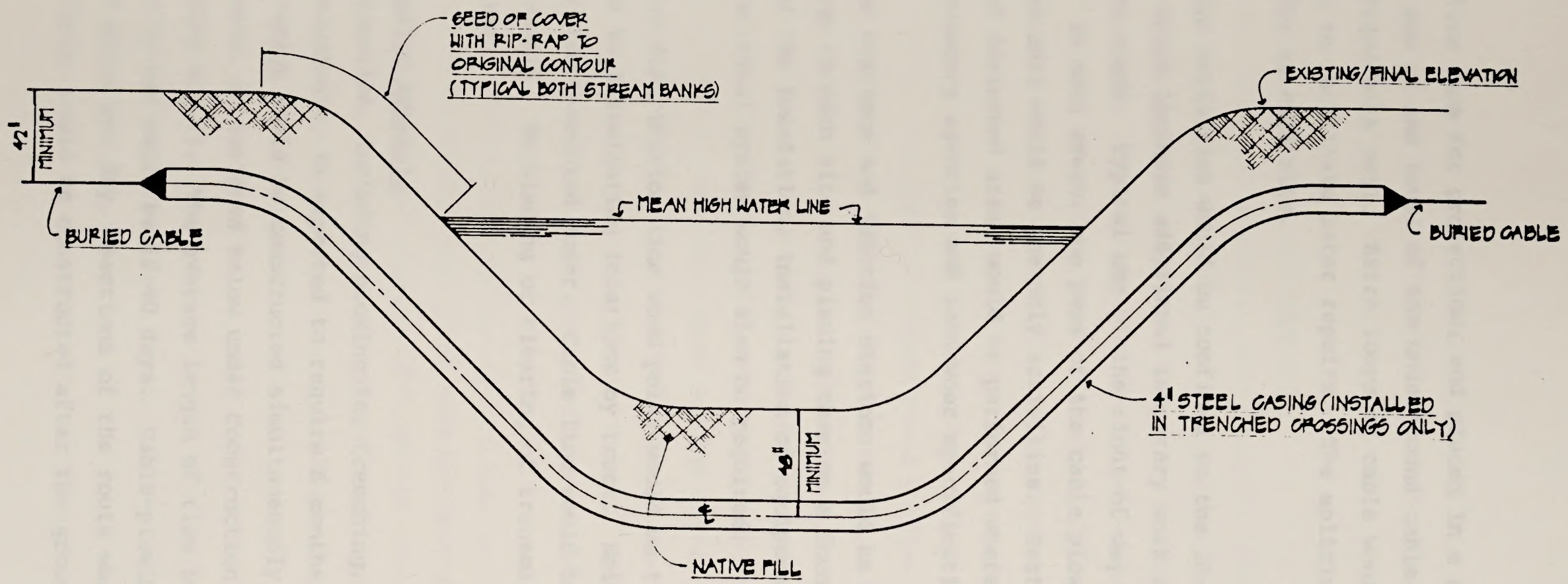
Splices would be required between adjacent reels of cable. Each fiber needs to be carefully spliced by fusing the ends together, in order to retain a clear signal with minimum attenuation and dispersion. Splicing would be done in specially equipped trailers or vans by trained contractor personnel. The ends of each cable would be pulled into the van and each of the 24 fibers spliced to the corresponding fiber in the adjacent cable. Spliced fibers would be immobilized on a board, placed




* MAY BE DEEPER IF LOCAL REGULATIONS REQUIRE.

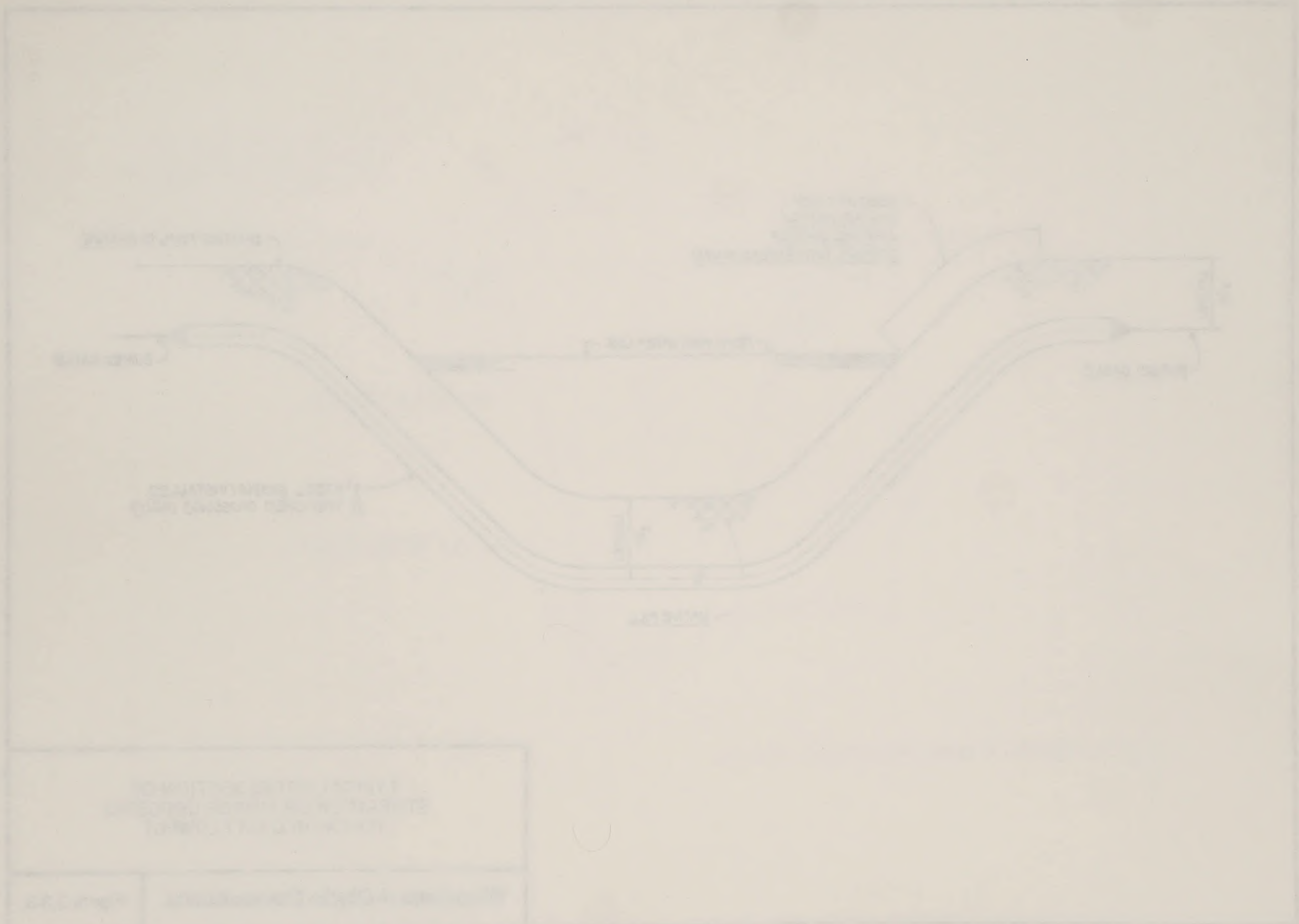
TYPICAL CROSS SECTION FOR TRENCH BURIAL

**Woodward-Clyde Consultants** | Figure 2.3-8




TYPICAL CROSS SECTION OF
STREAM OR DRAINAGE CROSSING
(TRENCHED OR PLOWED)

**Woodward-Clyde Consultants** | Figure 2.3-9



in a steel splice case for protection, and placed in a prefabricated concrete pull box at the level of the underground cable. The hole would then be backfilled with soil. Extra loops of cable would be stored in the splice box to facilitate later repairs. The splicing process would take about a day at each site.

Construction activities would be confined to the 20-foot right-of-way, which includes additional temporary work space, and existing access roads. Typical use of the right-of-way is shown in Figure 2.3-2. In most areas, one pass of the cable plow and compaction of the loosened soil would be the only activities. Restoration and revegetation of disturbed areas would be performed where required, and would meet regulatory agencies and landowner specifications.

Regenerator stations and junction stations would be constructed by moving buildings to each site and placing them on a foundation. Fencing, construction of the foundation, installation of equipment, and hookup to an existing electrical system would also be required.

Transmission distribution line wood poles would be transported on existing access to installation locations by truck. Holes for wood poles would be dug by truck-mounted auger. Cable line would be strung from truck-mounted spools. No blading or clearing of transmission line route would be required.

### 2.3.6 Construction Schedule

Cable construction, including plowing-in, trenching, regenerator stations, and terminals, is expected to require 6 months. Sections of the proposed project would be constructed simultaneously by separate construction crews, as outlined below under Construction Personnel and Equipment (Section 2.3.7). The average length of time to complete the work of a given spread would be 60-90 days. Cable-plowing crews may average 5 to 10 miles per day. Sections of the route where weather could be a limiting factor would be constructed after the ground had dried.

Other timing constraints for protection of ecological or other resources would be included in the project schedule where required by regulatory agencies.

2.3.7 Construction Personnel and Equipment

Cable laying, regenerator station installation, and cable splicing would likely be contracted separately for each segment of the fiber optic cable route. The system would be constructed in four major segments: Eastern Wyoming, Western Wyoming and Northern Utah, Salt Lake City to Las Vegas, and Las Vegas to Los Angeles. There would be several crews (spreads) working simultaneously within a given segment. It is anticipated that a total of 20 spreads would be located along the entire alignment. Support spreads would be required in areas where cable laying is slow or difficult. The typical spread would include a cable plow and a four to seven person crew. Support spreads would utilize a bulldozer, backhoe, trencher, and their crews and laborers could be needed at some point along the section. A supervisor and inspector would be present with each crew, and additional support personnel would be required. Road cuts and repairs would be made by a road saw and roller-compacter. Three- to four-person boring crews would utilize boring machines, 1-ton trucks, pickup trucks, and drivers. These pieces of equipment and reel trailers would also be required by most of the crew and spreads.

Splicing crews would consist of two technicians and a specialized trailer or van. Since one 24-fiber cross-section splice can be completed by one crew in a day, and approximately 390 splices would be required for the entire route, it is anticipated that a splicing crew would be required for every cable-installation spread. Each splice would be tested by the Applicant's inspector.

Installation contractors would be hired to prepare the regenerator station sites and the foundation, and to install the regenerator station. It is expected that three contractors would be hired for this task, one in each segment. Additional contractors may be hired for installation of terminal facilities.

Up to 20 construction crews with an average of seven workers may be required; this includes employees involved in construction supervision and inspection. The maximum construction workforce would be up to 140 people, depending on the number of crews operating at any given time.

All facets of the system's construction would be supervised and inspected by the Applicant's employees. The Applicant would typically have one inspector with each construction crew.

Existing housing facilities would be utilized by project construction workers, including personal accommodations, motels, and similar facilities. Workers would commute to construction areas using work trucks and personal vehicles.

2.3.8 Applicant's Mitigation

The Applicant would undertake a number of practices during construction and operation of the telecommunication system that are designed to mitigate potential adverse environmental impacts. These include accepted construction practices, restoration of disturbed areas, adherence to all applicable regulations, and other measures.

The measures are designed to mitigate potential impacts for all major environmental issues, including cultural resources, terrestrial and aquatic biology, air and water quality, soils, visual resources, socioeconomics, noise, and others. Planned mitigations within each environmental resource area are discussed below.

The Applicant would design an environmental education program for all project workers. A text would be developed which describes (1) important environmental resources present in the project area and their susceptibilities to potential project-related effects (2) mitigation measures committed to by the Applicant and (3) the roles of Applicant and contractor personnel in implementing these mitigation measures. The text would be presented to all company and supervisory contractor personnel

for required review before construction activities were initiated. In the environmental education program it will be emphasized that all measures committed to by the Applicant must be adhered to by all project personnel. The need for protection of fragile, and often irreplaceable cultural, paleontological, and threatened or endangered biological resources would be highlighted, along with the means for doing so. All project personnel would be made aware of the prohibition against collecting or willfully disturbing any such resource(s) and the consequences of violating such prohibitions.

The Applicant is committed to the stipulation that any project personnel found violating any such prohibition, or in any way willfully causing damage to or interfering with any prescribed mitigation measure, will be immediately removed from the project area and will be subject to termination of employment.

2.3.8.1 Cultural Resources. In addition to the environmental information program described above, procedures to identify and protect cultural resources would be developed in consultation with the State Historic Preservation Officer and the project permitting agency. Individual plans would be developed on a state-by-state basis. This approach will facilitate addressing the specific needs of each state. Agreements containing these plans will be integrated into the Class I cultural resource inventory report for each state (see Section 4.1.7). In general, the plans would include the following components:

- Synthesis of presently recorded data on cultural resource sites, locales, surveys, and other investigations would be compiled in conformance with the BLM requirements for a Class I Cultural Resource Inventory (Appendix G) the area potentially affected by the proposed project; this task is presently underway.

- Where required by the permitting agency, and prior to project construction, the Applicant would design and conduct a Class III

inventory of sensitive portions of the route. Additionally, areas that will be backhoed trenched, all ancillary facilities, and any other areas where cable will not be knifed in will be inventoried to Class III standards.

- Identified resources would be recorded and evaluated for National Register eligibility. Potential effects of the proposed project on eligible cultural resources would be evaluated using indicators set forth in 36 CFR 800.3.

- If adverse effects to properties listed on or eligible to the National Register of Historic Places may occur as a result of the proposed project, mitigation measures to reduce or eliminate those adverse effects would be implemented. This can be accomplished through resource avoidance or preconstruction scientific data recovery and report preparation by a qualified professional anthropologist, archeologist, or architectural historian.

Avoidance is commonly the preferred mitigation option and can often be accomplished through relocation of project components. Scientific data recovery may involve one or a combination of techniques/approaches; among them are 1) detailed surface mapping of sites (as opposed to scaled sketch maps completed during the survey and recording phase); 2) mapping and collection of artifacts (usually restricted to tools and diagnostic items) from areas of direct impact; 3) limited testing to evaluate the presence and nature of subsurface deposits and/or cultural features; and 4) full data recovery through excavation of subsurface deposits or features in the area of direct effect. The type and extent of mitigative technique that may need to be employed must be determined on a site-by-site basis, dependant upon the site type, surface and subsurface contexts, and the level of project-related effect.

- A construction monitoring program will be required in areas where cultural resource inventory indicates that resources are likely to be exposed by blading or trenching.

- Prior to construction, specific mitigation measures will be detailed in accordance with 36 CFR 800 for any cultural resources sites listed on or eligible for the national register of historic places. This management plan will be completed in consultation with the BLM, the Forest Service, and the SHPO.

  In conjunction with the permitting phases of the project, the cultural resources management plan for the project would be completed by a consultant to the Applicant. The major scheduling milestones for the plan would be identified through consultation with the BLM, Forest Service, and State Historic Preservation Officer.

In response to general provisions and implementing guidelines of NHPA, NEPA, AIRFA, ARPA, CEQA, and to the particular directives of the "Memorandum of Understanding Pertaining to Bureau of Land Management, California, Policy for Native American Concerns and Cultural Resource Management among The Native American Heritage Commission and The State Historic Preservation Officer and The Bureau of Land Management, California," potentially affected California Indian individuals and groups would be consulted in regard to potential project effects on heritage values as well as religious sites. Individuals and addresses are included in the Class I cultural resources inventory document for California.

The following steps have been undertaken to initiate this process: 1) referral lists for San Bernardino and Los Angeles counties compiled by the Native American Heritage Commission were used to identify appropriate California Indian contacts to be advised about the proposed Williams Communications project; and 2) a letter, accompanied by a map of

1:500,000 scale showing the proposed route, was sent to each person or organization listed. A copy of the notification letter and list of addresses to which it was sent is provided in Appendix G.

2.3.8.2 Terrestrial Biology. A preliminary assessment has been prepared for threatened and endangered species that could occur along the proposed or alternative routes. No effect findings are anticipated for all listed or proposed species. However, prior to any ground disturbance on public or National Forest System lands, concurrence must be obtained from the U.S. Fish and Wildlife Service. If any critical habitat could be affected, appropriate clearance surveys and/or mitigation would be implemented.

As identified by biologists from BLM districts, USFS, and USFWS, the Applicant would employ the following measures to reduce or eliminate potential impacts. Specific design would be in accordance with BLM district or National Forest guidelines.

- In identified raptor or sage grouse breeding or nesting areas, construction activity would be scheduled to avoid the period February 1-July 15.

- In identified bighorn sheep migration corridors, construction activities would be scheduled to avoid the migration period.

- Construction activities in moderate to high density (51-250 individuals per square mile) desert tortoise habitat would be scheduled to occur during the period from October to March when tortoises are underground and hibernating. During construction activities in high density (51-250 individuals per square mile) tortoise habitat, a qualified biologist would be onsite to locate and mark any tortoise dens or individuals that could be adversely affected by construction and installation activities.

Active animals would be moved out of danger and dens would be avoided if possible. If dens cannot be avoided, tortoises would be removed and any hibernating animals would be properly cared for.

- A 25-foot buffer would be maintained around prairie dog towns identified within the right-of-way or a 25-foot buffer from individual prairie dog holes if it becomes necessary to traverse through a prairie dog town. A qualified biologist will be present if it becomes necessary to traverse.

- Avoid disturbance to any identified dense riparian habitat in the California desert and Cajon Canyon area to eliminate impacts to the Least Bell's vireo.

- Raptor deflectors would be installed on overhead transmission distribution poles (connecting to regenerator stations) in identified raptor concentration areas. Specific design would be in accordance with BLM district or USFS guidelines.

2.3.8.3 Aquatic Biology. Construction activities within intermittent streams would be scheduled during low-flow periods to avoid potential impacts on fishery resources due to increased siltation and potential petroleum spills from construction vehicles.

Measures to avoid or minimize potential impacts to aquatic resources include:

- Streambed crossing would be limited to the minimum width required for construction equipment. This would be effective in minimizing the impact of increased turbidities and protecting overhead cover for habitat maintenance.

- Schedule timing of construction at stream crossings with identified salmonid populations to avoid spawning periods. This measure would help maintain the self-propagating populations of salmonid species by avoiding construction activities that may cause siltation and/or disruption of redds during spawning periods (Table 3.6-1 lists the spawning periods for each species). The periods April 1 through June 15 (for spring spawners) and October 1 through November 15 (for fall spawners) should be avoided to minimize disruption of redds (Stewart 1986; Wilson 1986).

2.3.8.4 Air Quality. The Applicant would conduct all activities associated with the project in a manner that would avoid or minimize potential degradation of air quality. During construction, operation, maintenance, and abandonment of the project, the Applicant would perform all activities in accordance with applicable air quality standards, including, but not limited to, standards adopted pursuant to the Clean Air Act, as amended (42 USC 7401, et seq.). In addition, construction emissions would be mitigated through proper maintenance of construction equipment, by maintenance of manufacturer-installed exhaust systems for construction equipment, and by watering the construction zone to control fugitive dust emissions where needed.

2.3.8.5 Geology. Measures that would be employed to limit slope failure during construction or operation would include: a) monitoring disturbed areas to identify potential for instability; b) careful placement of the route and avoidance of recognized active slides (no active slides have been mapped on the route); c) grading, clearing, and cutting fills in a way to minimize effects on natural drainage and slope stability; d) rock saws used instead of blasting where bedrock is encountered; e) backfilling and restoration of trenches; f) design and implementation of reclamation measures on steep or unstable slopes (>3:1); g) construction or placement of erosion control features to limit steepness and

length of slope (i.e., water bars, collection ditches, terraces, rock mulch, sand bags, or straw bales for temporary control); and h) seeding disturbed areas with seed mixture of adapted grass or other plant species approved by the appropriate management agency and/or landowner.

2.3.8.6 Soils. Reclamation and erosion control measures would be used by the Applicant to mitigate potential impacts on soils. While areas in which plowing was conducted would have relatively little disturbance, temporary work spaces, trenched areas, and other more disturbed areas could require restoration and revegetation. Mitigation measures to be employed would be site/soil-specific, and soils identified as occupying steep slopes, having high susceptibility to erosion, and/or being poor sources of suitable topsoil would receive particular attention. For the design and implementation of reclamation measures, steep slopes would be considered to be those with a greater than 3:1 slope unless specified otherwise by individual districts. Depending on the degree of slope, amount of disturbance, type of soil, and other site factors, methods may include use of excelsior or straw mulch with plastic netting, hydromulching, or hydroseeding. Other measures to stabilize disturbed soil material, reduce soil loss due to erosion, revegetate the right-of-way and ancillary facility sites, and restore soil productivity may include:

- Selective salvage and replacement of soil material suitable for use as topsoil for agricultural lands and those lands for which the landowner or land management agency requests that topsoil be salvaged and replaced, where trenching is utilized

- Construction or placement of erosion control features to limit steepness and length of slope (e.g., water bars, collection ditches, terraces, rock mulch [rip-rap], or sand bags or straw bales for temporary control)

- Preparation of the surface soil to receive seed, including surface roughening and tilling across slope

- Seeding disturbed areas with a seed mixture of adapted grass or other plant species approved by the appropriate surface management agency and/or landowner

- Mulching with hay, straw, or wood fibers

- Crimping of mulch on the contour into the soil or tacking netting over an organic mulch to hold the mulch, soil, and soil moisture

- Monitoring of disturbed areas to identify potential soil instability or eroded areas and to implement the required mitigation measures to restabilize the soils

All disturbed areas would be restored to their original configuration following cable placement. This would include compaction of the cable course with a rubber-tired vehicle, where required by regulatory agencies or landowners. Erosion control measures would be designed to limit long-term erosion. Required reclamation for the project would be established in a detailed Plan of Operations to be prepared by the Applicant for approval by the BLM. Restoration methods on National Forest system lands would be specified in land use authorizations. Individual agreements would be established with affected landowners.

2.3.8.7 Visual Resources. Mitigation measures would be implemented to the extent possible to reduce or minimize visual contrasts for the cable right-of-way, regenerator stations, and ancillary facilities. There are three generic types of mitigation techniques: (1) strategic location, (2) minimization of disturbance, and (3) repetition of the basic landscape elements (form, line, color, texture). The implementation of

mitigation procedures described below, which are based on these techniques, would effectively reduce potential visual contrasts of project facilities.

- Grading would be conducted in a manner which would minimize erosion and conform to the natural topography.

- The structures would be painted to be uniform and noncontrasting in order to blend with the surrounding landscape.. Standard environmental colors would be selected through coordination with the BLM and USFS. Building structures associated with new regenerator stations have a rock/sandstone textured exterior and the trim would be painted desert tan or as specified by the land manager.

- New wood transmission line poles would be utilized to reduce visual contrasts with the natural surroundings and to provide visual blending into settings through which the line must pass. Wherever possible, existing electric transmission lines would be utilized. If not available, new lines would be placed strategically, to the greatest practicable extent, to make maximum use of existing topography and vegetation for screening.

2.3.8.8 Water Resources. In order to reduce the potential for exposure of the cable during operation, the cable would be placed below mean scour depths. Construction contractors would minimize time of disturbance and area disturbed in streams and rivers and would stabilize disturbed areas promptly. Maintenance workers would check the cable burial depth periodically at stream and river crossings. At crossings where channel degradation had exposed the cable, reburial of the cable to the proper depth would be accomplished.

2.3.8.9 Land Use, Recreation, and Transportation. Construction methods for road crossings would be designed to mitigate potential adverse impacts on transportation facilities. The following measures would be implemented:

- Warning signs would be positioned sufficiently far in advance of construction zones to warn vehicle drivers. Signs would be positioned in accordance with regulations. Warning signs, barriers, flagpersons, and other techniques would be used, as appropriate.

- Detour routes would be established using the nearest available secondary access routes.

The project construction workforce would use commercial accommodations and would not use public campgrounds for temporary housing; however, recreational use of these facilities would not be denied to workers.

In areas where the cable would cross agricultural fields, the following measures would be implemented by the Applicant to avoid or repair potential damage to such fields:

- Small-scale route variations to avoid sensitive fields, if practicable.

- Small-scale adjustments in construction scheduling to avoid sensitive time periods during agricultural practices, if practicable.

- Limiting of trenching to depths above drainage tiles, if practicable.

- Restoration of disturbed fields and irrigation ditches to preconstruction conditions or conditions acceptable to landowners. Specific measures may include drainage tile, ditch, and pipe replacement, and re-establishment of required grade for drainage.

Where fences are encountered along the right-of-way, adequate bracing would be installed at each edge of the right-of-way prior to cutting the wires and installing temporary wire gaps or gates. Gates would be kept closed when not in use. A construction employee would be present to prevent livestock escape when a gate was in use and open. Following completion of construction, the Applicant would restore the fences with a locked gate or to owners', tenants', and/or lessees' specifications. No gates or cattleguards on established roads over public land would be locked, blocked, or closed by the Applicant without approval. Any cattleguards damaged by the Applicant would be repaired to as near original condition as practicable or replaced. If a natural barrier used for livestock control were damaged during construction, the Applicant would fence the area in such a manner as to equal the effectiveness of the existing natural barrier.

2.3.8.10 Noise. Mitigation measures for noise impacts primarily relate to construction. Because the extent of these temporary noise impacts would be primarily related to the number of people exposed to the noise and the perceived nuisance associated with the noise, the most significant mitigation measures would be to reduce or eliminate the generation of noise during times when the greatest nuisance was perceived. Typically, this would be during the nighttime hours. Thus, the fact that construction would occur only during daylight hours is in itself a major mitigation measure. In addition, proper construction equipment operating techniques and maintenance of manufacturer's installed noise abatement equipment would be implemented to reduce noise levels to the greatest possible extent during construction activities.

Emergency power generators may be located at remote regenerator station. Noise from these sources would be temporary and would be mitigated by mufflers installed by the manufacturer.

2.3.8.11 Public Monuments and Markers. Where the right-of-way includes public lands, the Applicant would avoid disturbance or removal of cadastral survey monuments and markers. If the removal of monuments or markers were necessary during specific construction activities, the Applicant would advise the appropriate agency. Removal and/or relocation would then be completed in accordance with detailed instructions established by the appropriate agency.

2.3.8.12 Paleontological Resources. Applicant-committed practices would serve to avoid any potential effects resulting from project implementation. Measures to avoid effects would include:

- Identification of known fossil localities through search of museum locality files, and consultation with paleontologists currently engaged in research in these regions.

- If necessary, a field inventory would be conducted to locate surficial fossil materials.

- Based on results of the inventory, a program of limited collecting and avoidance could be designed to ensure that project implementation would result in no effect on the identified resources.

2.3.9 Compliance Check

The entire construction operation would be managed by a team of experts in the field of telecommunication systems construction. This team would be completely independent of the construction companies. The team would be employees of the Applicant or specifically contracted for

the purpose of ensuring that the construction was completed in accordance with design specifications, good engineering and construction practices, and permit or right-of-way easement stipulations and specifications.

2.3.10 Operation and Maintenance

Operation and maintenance activities would be housed in Regional Network Control Centers in the cities where the Applicant has terminal facilities. A break in the cable or other system failure would temporarily disrupt communications, but would cause no public hazard. Common carriers using the Applicant's fiber optic cable would route communications by other methods until the failure was fixed. If a break in the cable occur red, an alarm would go off immediately and indicate between which regenerator stations the break occurred. The exact location of the break would be determined by use of an optical time domain reflectometer (OTDR). The broken cable would be dug up and spliced. A temporary splice would be made immediately and a permanent splice during a time of low use (e.g., night). Periodic aerial reconnaissance of the cable right-of-way would be conducted.

Regenerator stations would be unmanned, but would be visited every 1-2 weeks for inspection and maintenance. In the event of a power failure, the batteries at each station would maintain equipment function for 8 hours, by which time power should be restored. If a prolonged commercial power outage were expected, a portable emergency generator would be brought onsite to power the regenerator. Generators would be placed at remote stations where repairs might take longer in order to ensure continual operation.

Test equipment, parts, and technicians would be stored or based at the regional control centers.

### 2.3.11 Future Plans and Abandonment

The current project involves construction of an interstate fiber optic cable and service to eight cities. Service could be extended to additional towns and cities in the future by construction of laterals from the mainline.

Fiber optics is a new and rapidly advancing technology. It may be possible to increase the communication capacities of the cable in the future by installing new equipment at the regenerator and terminal stations. No change in the cable itself would be required.

The expected lifetime of the cable according to manufacturers is up to 75 years. Equipment at the regenerator and terminal stations would have a shorter lifetime, particularly because of rapidly advancing technology, but could be easily replaced. At the end of cable service, the cable itself would be abandoned in the ground. Above-ground facilities would be removed and the sites restored.

## 2.4 ALTERNATIVES

The EA process requires identification of reasonable alternatives and consideration of environmental, social, and economic effects of these alternatives. In the following sections, brief descriptions are presented for all reasonable alternatives to the proposed action that were subjected to further analysis. Alternatives not selected for more detailed analysis are identified and reasons for their not being further considered are given. Only those aspects of the alternatives that are different from the proposed action are discussed in Section 4.0.

### 2.4.1 Alternatives Assessed

#### 2.4.1.1 Routing Alternatives.

Mountain Bell. This alternative follows the existing Mountain Bell communication (cable) line (Appendix F) which was installed in the early 1940s by a bucket trench method. The route would begin in Colorado, off

of Interstate 25, less than half a mile from the Wyoming border. The route would proceed north to Cheyenne and then west to Laramie, Rawlins, Rock Springs, Green River, and Evanston. Ownership of lands traversed is shown in Table 2.4-1.

CalNev Products Pipeline. This alternative would follow the CalNev Pipeline Company right-of-way from Las Vegas, Nevada, to Victorville, California. The CalNev right-of-way proceeds south along Interstate 15 to the border of California. In California, the pipeline right-of-way continues to parallel Interstate 15 southwest to Barstow. At this point the CalNev right-of-way proceeds southwest to Cajon Pass. The route parallels Interstate 15 over Cajon Pass to Fontana and then proceeds west following various roadways into downtown Los Angeles. Ownership of lands traversed is shown in Table 2.4-1.

Camp Williams. This alternative route would be approximately 6 miles in length and would cross private lands near the town of Lehi, Utah, and Utah Lake. The alternative would be located approximately 1 mile east of the proposed route and outside the eastern boundary of the Camp Williams state Military Reservation.

2.4.1.2 No-Action Alternative. If no action were taken, the right-of-way grant would not be issued and the cable would not be installed. Environmental impacts associated with the project would be avoided. The Applicant could seek an alternate route, but it is unlikely they could obtain one that would not cross BLM land. It is therefore likely that without a right-of-way grant, the cable between Cheyenne junction and Los Angeles would not be installed along this or any other route.

2.4.2 Alternatives Eliminated from Furthur Analysis

2.4.2.1 Communication Systems. Alternative long-distance transmission systems include satellite, microwave, and copper cable. These have been rejected from further consideration by the Applicant for this project

because of fiber optic's clear superiority in both technical performance and cost. Several considerations are involved:

- First, although the total cost of constructing a fiber optic telecommunication system is roughly comparable to other transmission systems, its cost per voice channel is substantially less than the others because of its large transmission capacity. Both the large capacity and low cost are important factors in serving the West Coast market.

- Second, fiber optic cables are unaffected by weather or electromagnetic interference, and have lower transmission error rates than the other systems. Fiber optic cables can also carry a full range of telecommunications.

- Third, anticipated advances in fiber optic technology within the next few years may greatly increase the transmission capacities of installed fiber optic cable. These may include higher speed terminals and multiplexing of lightwave channels on a single fiber. These would be installed through modifications to regenerator stations and would not require removal or modification of the cable itself. These changes would be relatively low in cost and would further increase the superiority of fiber optic cable systems over alternative technologies.

2.4.2.2 Routing Alternatives.

CHEYENNE JUNCTION TO LOS ANGELES

- Interstate highways, Routes 80 and 15, from Cheyenne to Los Angeles. The alternative (parts of which were alternatives for virtually every segment) would involve plowing the cable within the interstate highway right-of-way. It was considered

Table 2.4-1. OWNERSHIP OF LAND TRAVERSED BY THE ALTERNATIVES

| | BLM (Miles) | State or Private (Miles) | National Forest System Lands (Miles) | National Wildlife Refuge (Miles) | Military (Miles) |
|---|---|---|---|---|---|
| | | | MOUNTAIN BELL ALTERNATIVE | | |
| Wyoming | 90 | 301 | 5 | - | - |
| | | | CALNEV ALTERNATIVE | | |
| California | 78 | 10 | - | - | - |

infeasible in that the Federal Highway Administration and affected state highway departments expressed a strong and consistent policy against allowing longitudinal encroachment on the highway right-of-way, except in limited, emergency situations.

- Union Pacific Railroad Right-of-Way from Cheyenne Junction, Colorado, through Wyoming, Utah, and Nevada to Los Angeles. This alternative (parts of which were alternatives for virtually every segment) would involve plowing the cable in adjoining the railroad tracks. It was determined to be impractical, infeasible and/or unrealistic for several reasons: First, construction and maintenance were considered more difficult due to the requirement that survey, preparation, construction and maintenance activities must be scheduled around existing train activities. In addition, foreign material is frequently discovered buried in the railroad right-of-way, making plowed-in construction more difficult. Occasional flooding occurs in the Meadow Valley area of Nevada, threatening line integrity and making maintenance more difficult. This alternative was considered to be generally less secure than the proposed action in some areas due to railroad maintenance activities that may damage the cable. It was also considered to be a somewhat speculative and conjectural option by the applicant in that Union Pacific has granted a longitudinal right-of-way to a competitor. A fiber optic cable in the same right-of-way would be susceptible to the same problems and any damages would probably affect both cables. The Applicant considers this impractical.

CHEYENNE, WYOMING, TO SALT LAKE CITY

- Union Pacific Railroad, as previously discussed.

- Interstate Highways, as previously discussed.

Amoco Pipeline. This alternative was considered to represent essentially the same route as the proposed action, therefore presenting no significant distinguishing characteristics that would aid in a comparison of alternatives. It would also be more costly to the Applicant in that the Applicant would have to acquire right-of-way in an area already served by Northwest Central pipeline, a company affiliated with the Applicant.

- Colorado Interstate Gas Pipeline and/or Trailblazer Pipeline, connecting to Mountain Fuel Pipeline to Salt Lake City. This alternative was considered to be less practical and feasible and to be environmentally inferior in that it was a longer, less direct route that often passed through more untrammeled, mountainous terrain in Wyoming and Utah. The fact that it is a less direct route increases construction, maintenance, and operation costs to the applicant and would disturb more public and private land. The environmental impacts would also be greater throughout the mountainous portions of the routes. In addition, the alternative was considered speculative and conjectural in that Mountain Fuel advised the Applicant that it did not approve of additional encroachments upon its right-of-way.

- Pacific Power transmission line right-of-way from Rawlins to Kemmerer, Wyoming, connecting to Utah Power from Kemmerer to Salt Lake City. This construction would have been either overhead on existing towers or buried in the right-of-way. This alternative was considered to be inferior because overhead power lines are less secure than a buried cable and because, if buried, would involve new environmental impacts to the right-of-way that could otherwise be avoided by selection of either of the alternatives discussed in detail. This alternative was also considered to be impractical, speculative, and conjectural in that Pacific and Utah Power both opposed

utilization of their rights-of-way over this route. Portions of the route were considered to be so similar to the proposed action that the impacts were not distinguishable and therefore provided no useful comparative information.

- Mountain Bell Alternative from Evanston, Wyoming, to Tintic, Utah (south of Utah Lake). This alternative was considered environmentally inferior because of significant impacts primarily in the area of Emigration Canyon which could otherwise be avoided by selection of the proposed action. Briefly, these impacts would include:

  - Active landslides and slumps along the route in Emigration Canyon drainage

  - Moderate to high water erosion hazard in Emigration Canyon drainage

  - Sensitive watershed values in Emigration Canyon--e.g., springs used as domestic water and surface flows with important recreation value

  - Approximately 7 miles of mule deer critical winter range and 8 miles of elk critical winter range would be traversed in the Grass Creek and Weber River drainage areas

  - Potential conflicts with planned or existing residential land use in the Emigration Canyon area

SALT LAKE CITY TO LAS VEGAS

- Interstate highways, as discussed above.

- Union Pacific Railroad, as discussed above.

- Other state and local highway rights-of-way. This alternative was not studied in detail because the other combinations of state and highway rights-of-way available to the Applicant were generally more costly, environmentally inferior, or not sufficiently different from the proposed action as to be distinguishable and provide useful comparable data. Those combinations of routes that were studied were longer and less direct, and therefore most costly and disruptive to install, operate, and maintain, or traversed lands that were more sensitive or controversial, or included land managed or owned by parties that may not permit access.

- Transmission line rights-of-way. Two possible routes were considered. The first route, from Salt Lake City to Las Vegas, would follow Utah Power & Light's (UP&L) utility right-of-way to the junction with the Intermountain Power Project (IPP) utility right-of-way west of Nephi, Utah, and would follow the IPP route to Las Vegas. The second route considered would follow Utah Power & Light from Woods Cross south to Richfield along their 345-kV transmission line, then southwest to near Enterprise on their 230/138-kV system, then connecting west to a proposed system to the Nevada border where they would intertie with a proposed Nevada Power transmission line to Las Vegas. These alternatives were considered speculative and conjectural because UP&L opposed granting longitudinal encroachments within their right-of-way. It would also involve somewhat more construction difficulty and cost to the Applicant because, while power lines span rough terrain, the buried cable must approach more indirectly. For most portions of the right-of-way, construction access would be more difficult and environmentally inferior than the proposed action in that roads would be less convenient or new roads would have to be constructed. This alternative may also involve some disturbance of previously undisturbed land within the utility rights-of-way, although most such land was

disturbed during the recent construction of IPP. Further, the second transmission route has not yet been constructed. It is not believed that construction would be completed until after the fiber optic line is in service.

LAS VEGAS TO VICTORVILLE, CALIFORNIA

- Interstate highway system, as discussed above.

  State or county roads. No state or county roads were identified that provided a direct route over suitable terrain to Victorville. The roads in the general area also traversed sensitive (Mohawk National Scenic Area) areas or areas where acquisition of a right of way was a speculative or conjectural option (military land).

- Union Pacific Railroad to Daggett, California (east of Barstow), then on Santa Fe Railroad to Victorville. This alternative was considered infeasible and unpractical because, inter alia, of significantly increased costs to the Applicant. The route was significantly less direct and, as a consequence, construction, maintenance and operating costs to the Applicant would be much higher. It was considered unreasonable, speculative, and conjectural because Santa Fe is owned by the same company (Fibertrak) which has announced a competing fiber optic cable. Location of the cable in the railroad right-of-way also includes some of the disadvantages noted in the Union Pacific alternative discussed above.

VICTORVILLE TO LOS ANGELES

- Transmission line right-of-way. Southern California Edison south to Mira Loma, then west to downtown. This was considered environmentally inferior and rejected because of very rough

terrain over Cajon Pass which power lines can span but buried cable must approach more indirectly. Also, it was considered to be unreasonable from a cost to Applicant in that the route south of the pass is more circuitous, resulting in much greater cost and more difficult, time-consuming, and expensive permitting.

- Gas pipeline - Southern California Gas. This alternative was considered speculative and conjectural because, while the pipeline routes present a number of alternatives, Southern California Gas' policy prohibits installation of permanent facilities within their right-of-way, blocking longitudinal encroachment by a fiber optic system. This alternative was also considered unreasonable in that the subject rights-of-way do not have communications rights, necessitating a costly and lengthy negotiation process in this densely populated area composed of small tracts.

- Railroads. The Union Pacific route into Los Angeles from Victorville was considered unreasonable in that it adds substantial, costly mileage versus other alternatives and it not continuous. It requires utilization of Santa Fe Railroad's right-of-way through Cajon Pass. Acquisition of this right-of-way from Union Pacific or Santa Fe was also considered speculative and conjectural for the reasons previously discussed. It also includes some of the disadvantages noted in the Union Pacific alternative discussed above.

## 2.5 REGULATORY COMPLIANCE WITH SELECT LAWS AND EXECUTIVE ORDERS

This subsection provides a listing of potential federal and state (Colorado, Wyoming, Utah, Nevada, and California) permits, approvals, reviews, and similar actions required for the proposed project. The major areas of federal and state permit, approval, or review jurisdiction include:

- Rights-of-way over land under federal jurisdiction
- National Environmental Policy Act (NEPA) compliance
- California Environmental Quality Act (CEQA)
- Air resources
- Biological resources
- Cultural resources

Necessary federal and state permits are listed in Tables 2.5-1 and 2.5-2.

Table 2.5-1. SUMMARY OF POTENTIAL FEDERAL PERMITS AND AUTHORIZATIONS REQUIRED FOR THE PROPOSED PROJECT

| Concern | Action Requiring Permit, Approval, or Review | Agency | Permit, Approval, or Review | Relevant Legislation |
|---|---|---|---|---|
| Rights-of-Way Over Land Under Federal Jurisdiction | Construction, Operation, and Abandonment of Facilities on Federal Land | Bureau of Land Management (BLM) | Grant of Right-of Way | Federal Land Policy and Management Act |
| | | Forest Service (FS) | Special Use Authorization Permit, or Easement | |
| National Environmental Policy Act (NEPA) Compliance | Granting of Rights-of-Way Over Land Under Federal Jurisdiction for Implementation of Project | Lead Agencies - BLM; Cooperating Agencies; Forest Service, Fish and Wildlife Service | | NEPA |
| Water Resources | Construction Across Streams and Rivers | Army Corps of Engineers | General Easement | 10 USC 2668, 2669<br>43 USC 961 |
| | Discharge of Dredge and Fill Materials | | 404 Permit (Nationwide) | Clean Water Act |
| | Placement of Structures and Work in Navigable Waters | | Section 10 Permit | River and Harbors Act |
| Biological Resources | Grant of Right-of-Way by Federal Land Management Agency | Fish and Wildlife Service | Endangered Species Act Compliance by Federal Land Management Agency and Lead Agency | Endangered Species Act, Section 7 |
| Biological Resources | Grant of Right-of-Way by Federal Land Management Agency Involving Aquatic Habitats | | Fish and Wildlife Coordination Act Compliance by Federal Land Management Agency and Lead Agency | Fish and Wildlife Coordination Act |

Table 2.5-1. SUMMARY OF POTENTIAL FEDERAL PERMITS AND AUTHORIZATIONS REQUIRED FOR THE PROPOSED PROJECT (concluded)

| Concern | Action Requiring Permit, Approval, or Review | Agency | Permit, Approval, or Review | Relevant Legislation |
|---|---|---|---|---|
| Cultural Resources | Grant of Right-of-Way by Federal Land Management Agency | BLM, FS, Advisory Council on Historic Preservation, Inter-agency Archeological Service | National Historic Preservation Act Compliance by Federal Land Management Agency and Lead Agency | National Historic Preservation Act, Section 106 |
| | | All | Emergency Procedures for Cultural and Historic Properties Discovered During Construction | Archeological and Historic Preservation Act (AHPA) Public Law 93291 |
| Native Americans | | All | Protection and Preser-vation of Native American Religious and Cultural Rights and Practices | American Indian Religious Freedom Act (AIRFA) |
| Communications | Fiberoptics Cable System Operation | Federal Communica-tions Commission | 63.07(b) Report | 47 CFR 63.07(b) |
| Construction | Laying of Cable/ Construction of Repeater Station | Occupational Safety and Health Administration (OSHA) | Regulations and Standards | 29 CFR 1910<br>29 CFR 1926 |

Table 2.5-2. SUMMARY OF POTENTIAL MAJOR STATE PERMITS REQUIRED FOR THE PROPOSED PROJECT

| Concern | Action Requiring Permit, Approval, or Review | Agency | Permit, Approval, or Review | Relevant Legislation |
|---|---|---|---|---|
| COLORADO | | | | |
| Land Use | Crossing State School Lands | State Board of Land Commissioners | Right-of-Way Permit | Colorado Revised Statutes 36-1-136 and 38-5-102, as amended |
| | Installation of Utility Line within Highway ROW | Department of Highways | Underground and Utility Permit | Colorado Revised Statutes 38-5-101 (1873) |
| | | | Survey Permit (Highways Access Approach) | |
| Water Resources | Discharge of Dredge or Fill Materials into Rivers, Streams, or Adjacent Wetlands | Water Quality Control Division of State Dept. of Health | 401 Certificate | Federal Water Pollution Control Act, Colorado Water Quality Control Act |
| Air Quality | Emissions of Propane-Fuel By-Products | Air Pollution Division of State Dept. of Health | Air Pollution Emission Notice (APEN) | Colorado Air Quality Control Act of 1979 |
| Cultural Resources | Crossing State Lands | Office of Historic Preservation | "Clearance" from State Historic Preservation Officer in Consultation with Lead Federal Agency (vis-a-vis Section 106 process) | Colorado Historical, Prehistorical, and Archaeological Resources Act of 1973 |

Table 2.5-2. SUMMARY OF POTENTIAL MAJOR STATE PERMITS REQUIRED FOR THE PROPOSED PROJECT (continued)

| Concern | Action Requiring Permit, Approval, or Review | Agency | Permit, Approval, or Review | Relevant Legislation |
|---|---|---|---|---|
| WYOMING | | | | |
| Land Use | Crossing State School Lands | Wyoming Board of Land Commissioners | ROW Easement | Wyoming Statutes 3.6-14 and 36-34 (1957) |
| Land Use | All New Construction Within State with Estimated Cost of $97.45 million or above | Wyoming Industrial Siting Council | Information Applicant<br><br>Certificate of Insufficient Jurisdiction<br><br>Industrial Facility Permit | Wyoming Industrial Development Information and Siting Act |
| Air Quality | Emission of Air Pollutants | Department of Environmental Quality | Air Quality Permit to Construct<br><br>Air Quality Permit to Operate | Wyoming Statutes Ch. 9.1, Articles 1-11 |
| Water Resources | Construction, Hydrostatic Testing, Operation | State Engineer | Temporary Water Rights for Construction | Wyoming Statutes 41-4,41-10 |
| Right-of-Way Encroachment | Linear Project Crossing or Otherwise Encroaching on State Highway ROW | Department of Highways | Utility Crossing Permit | |
| Cultural Resources | | Office of Historic Preservation | Consultation with State Historic Preservation Officer and Lead Federal Agency | NHPA, ARPA |

Table 2.5-2. SUMMARY OF POTENTIAL MAJOR STATE PERMITS REQUIRED FOR THE PROPOSED PROJECT (continued)

| Concern | Action Requiring Permit, Approval, or Review | Agency | Permit, Approval, or Review | Relevant Legislation |
|---|---|---|---|---|
| WYOMING (cont'd) | | | | |
| Land Use | Construction Outside Existing ROW | Office of Commissioner of of Public Lands | Application for new (virgin) ROW | |
| | Use of Existing ROW | | Subordination Agreement | |
| UTAH | | | | |
| Land Use | Crossing State Lands | Division of State Lands | Easement to Cross State-Owned Land | Utah Code, annotated Title 65 |
| ROW Encroachment | Crossing State Roadways | Division of Transportation | Permit to Cross State Roadway Row | State Code 2712-133 |
| | Construction within state roadway ROW | | Utility Line Agreement | State Code 2712-133 |
| Air Quality | Operation of Machinery Emitting Pollutants into Atmosphere | Bureau of Air Quality | Notice of Intent | U.S. Department of Health Regulation Part 3 Sec. 3.3.1 |
| Cultural Resources | Project Construction | Office of Historic Preservation | Consultation with State Historic Preservation Officer and Lead Federal Agency | State Antiquities Act, 1973 |

Table 2.5-2. SUMMARY OF POTENTIAL MAJOR STATE PERMITS REQUIRED FOR THE PROPOSED PROJECT (continued)

| Concern | Action Requiring Permit, Approval, or Review | Agency | Permit, Approval, or Review | Relevant Legislation |
|---|---|---|---|---|
| NEVADA | | | | |
| Natural and Cultural Resources | Crossing State Lands | Division of State Lands | Easement onto State Lands | Nevada Revised Statutes 321.001 |
| ROW Encroachment | Encroachment into State Roadway ROW | Nevada Department of Transportation | Right-of-Way Occupancy Permit | Nevada Revised Statutes 408.423 |
| Ground Surface Disturbance | Project Construction | Division of Environmental Protection | Registration Certificate | Nevada Administrative Code 445.704 |
| CALIFORNIA | | | | |
| Rights-of-Way Through State-owned Lands | Construction, Operation, and Abandonment of Facilities on State Land | State Lands Commission | Land Use Lease | California Public Resources Code, Section 600 et seq. |
| Encroachment within, under or over State Highway Right-of-Way | | California Department of Transportation | Encroachment Permit | California Streets and Highways Code, Sections 660-734 |
| California Environmental Quality Act (CEQA) Compliance | Site Approval for Regenerator Stations | Lead - San Bernardino County | | CEQA |
| Air Resources | Construction of Generator Stations which may emit pollutants into atmosphere | Air Pollution Control District | Authority to Construct | California Health and Safety Code, Sections 39000-43834 |

Table 2.5-2. SUMMARY OF POTENTIAL MAJOR STATE PERMITS REQUIRED FOR THE PROPOSED PROJECT (concluded)

| Concern | Action Requiring Permit, Approval, or Review | Agency | Permit, Approval, or Review | Relevant Legislation |
|---|---|---|---|---|
| CALIFORNIA (cont'd) | | | | |
| Air Resources (cont'd) | Operation of equipment that emits pollutants into atmosphere | Air Pollution Control District | Permit to Operate | California Health and Safety Code, Sections 39000-43834 |
| Water Resources | Discharge of Waste Water, Hydrostatic Test Water | Regional Board, State Water Resources Control Board (SWRCB) | National Pollutant Discharge Elimination System (NPDES) Permit | Federal Water Pollution Control Act |
| | | | Report of Waste Discharge | Porter Cologne Water Quality Control Act |
| | Appropriation of Water, Hydrostatic Test Water | Division of Water Rights, SWRCB | Temporary Permit to Appropriate Water | California Water Code, Divisions 1 and 2 |
| Biological Resources | Alteration of the Natural State of Any Stream | Department of Fish and Game | Stream Alteration Agreement (1601 and 1603) | California Fish and Game Code, Sections 1600-1607 |
| Cultural Resources | Project Construction | Office of Historic Preservation | Consultation with State Historic Preservation Officer and Lead Federal Agency | CEQA<br>NHPA |

# 3.0 DESCRIPTION OF AFFECTED ENVIRONMENT

The affected environment for the proposed fiber optic telecommunication system was analyzed for the following resources or considerations:

- General Setting
- Geology
- Soils and Reclamation
- Water Resources
- Vegetation, Livestock, Range, and Grazing Rates
- Wildlife
- Land Use
- Cultural Resources
- Socioeconomics
- Visual Resources

A general description of the affected environments for each resource or consideration is presented in the following sections for the proposed action. Unless it varies from that of the proposed action, a description of the affected environment is not included for the alternatives.

## 3.1 GENERAL SETTING

### 3.1.1 Colorado

The proposed cable route would originate in north central Colorado, where the Northwest Central Pipeline crosses Highway 25. The cable would follow the Northwest Central Pipeline right-of-way northwest for 2 miles

before entering the state of Wyoming. The surrounding area is characteristic of the Great Plains; relatively flat topography with elevations along the route ranging from 6000 feet to 6500 feet. The county crossed in Colorado is Weld County.

The land ownership of the 2 miles of proposed route in Colorado is a "checkerboard" of state and private land. No major population centers exist in Colorado along this route; this portion of the route would be served by Cheyenne, Wyoming.

### 3.1.2 Wyoming

The proposed main cable route passes through southern Wyoming, following existing pipeline right-of-way along its entire length within the state. This right-of-way includes Northwest Central Pipeline from the Colorado/Wyoming border to Rawlins and the Pioneer Pipeline from Rawlins to the Wyoming/Utah border. The majority of the route roughly parallels Interstate 80. Major topographic features along the route include the Laramie Mountains, Laramie Basin, Medicine Bow Mountains, Great Divide Basin, Green River Basin, Bear River Divide, and Wasatch Mountains. The topography of the project area in Wyoming can be characterized as a series of plains and basins bordered by uplifted mountains and divides of moderate to high elevation. Elevations range from 6560 to 8200 feet along the route. Counties crossed in Wyoming are Laramie, Albany, Carbon, Sweetwater, and Uinta.

Wyoming has a relatively cool climate, due to its elevation. Summer high temperatures average between 85° to 90°F. Minimum winter temperatures range mainly from 5° to 15°F. Maximum precipitation occurs in spring and early summer. The driest part of the state has 5 to 8 inches of precipitation per year. In other areas, annual precipitation has reached 30 to 40 inches (Lowers 1960).

Ownership of the land potentially affected by the cable route is primarily Bureau of Land Management (BLM) and private. The eastern

portion of Wyoming is private for the majority of the route while the western portion is a "checkerboard" of BLM and private land. The proposed route in Wyoming contains 104 miles of BLM land and 247 miles of state and private land. The major population centers along the route include Cheyenne, Laramie, Rock Springs, Rawlins, Green River, and Evanston.

### 3.1.3 Utah

The proposed cable route trends roughly north/south and would follow the Pioneer Pipeline right-of-way from the Wyoming/Utah border to Salt Lake City and state and county road rights-of-way from Salt Lake City to the Utah/Nevada border. The terrain is typically basin and range formation, with elevations along the route ranging from 4264 feet in the Great Salt Lake Basin to 5740 feet in the Indian Peak Range. Counties crossed in Utah are Summit, Rich, Morgan, Davis, Salt Lake, Utah, Juab, Millard, Beaver, and Iron.

Climatic conditions in Utah vary from hot, dry deserts to temperate mountainous areas. Annual precipitation ranges from less than 6 inches in the deserts to more than 50 inches in the mountains. Average winter temperatures are around freezing, while summer temperatures can reach a maximum of 100°F (Greer 1981).

Ownership of land along the proposed route is primarily private in the northern portion of Utah. The land southwest of Camp Williams State Military Reservation has a "checkerboard" ownership pattern of BLM, private and state lands. The route would cross 84 miles of BLM land, 279 miles of state or private land, 3 miles of Wasatch-Cache National Forest land, and 2 miles of military reservation land. The major population centers along the route include Salt Lake City, Orem, Provo, and Cedar City.

### 3.1.4 Nevada

The proposed cable route trends roughly northeast/southwest across southern Nevada, along state and county road rights-of-way. The

traversed terrain is in a basin and range formation, with elevations along the route ranging from 2132 feet in Paradise Valley surrounding Las Vegas to 6232 feet in the Delamar Mountains. Counties crossed in Nevada are Lincoln and Clark counties.

Nevada possesses wide local variations in temperature and precipitation, due to varied and rugged terrain. Mean annual temperature in the southern portion is in the middle 60s, with long, hot summers and short, mild winters. Temperatures over 100°F occur frequently in the south, but with a lower humidity than in other areas of the country. In the southern valleys, rainfall can be less than 5 inches per year (Brown 1960).

The majority of land in southern Nevada is owned by BLM. The proposed route primarily traverses BLM land except in two valleys and in the Las Vegas area, which is private land. The actual ownership of land in Nevada is 109 miles of BLM land, 95 miles of state and private land, and less than 1 mile in National Wildlife Refuges. The major population centers along the proposed route are Las Vegas and Henderson.

### 3.1.5 California

The proposed cable route trends roughly northeast/southwest through southern California. The terrain is a basin and range formation with major topographic features which include the Clark, Shadow, and Soda mountains and the Mojave Desert. Further west are the Transverse Ranges and the Los Angeles Basin of the Pacific Border. Elevations along the route in California range from 394 feet in the Los Angeles Basin to 3936 feet in the Transverse Ranges. Counties crossed in California are San Bernardino and Los Angeles counties.

Climatic conditions along the proposed route are typical of a desert area. Annual precipitation in southern California ranges from less than 4 inches in the southeastern desert to 59-80 inches in the mountains north of Los Angeles. Average winter temperatures are above freezing to

a high of 55°F, while average summer temperatures range from 70°F on the coast to 95°F in the desert.

The ownership of the land traversed by the proposed route is primarily BLM in southeastern California and is a "checkerboard" of BLM and private land on the remainder of the route, except for the private land surrounding the urban areas. The proposed route in California traverses 105 miles of BLM land, 111 miles of private land, and 5 miles of the San Bernardino National Forest. The major population centers along the route include Barstow, Victorville, and the Los Angeles urban area.

## 3.2 GEOLOGY

### 3.2.1 Colorado

Geology along the approximately 2 miles of proposed cable route in Colorado consists of Oligocene deposits of the White River Formation and Miocene deposits of the Arikaree Formation. These deposits occupy mesas and low lying hills to the north of Warren Colorado, on the western edge of the Great Plains physiographic province. The general low relief and aridity along the route creates a low potential for landsliding. Incidents of slope failure are limited to isolated slides and rockfall on steep slopes. No active slides have been mapped on the route.

### 3.2.2 Wyoming

Geology along the cable route in Wyoming consists of Cretaceous and Tertiary sediments that occupy broad, structurally controlled basins. These basins are often flanked by anticlinal uplifts that have exposed Paleozoic formations and Precambrian rock. Quaternary alluvium is locally common on the proposed route. The general low relief and aridity in the region creates a low potential for landsliding other than the region of Bear River Divide where the potential is moderate (Krohn and Slosson 1976). Incidents of slope failure are limited to small, isolated slides on steep slopes. No active slides have been mapped on the cable

route. There is some potential for small isolated landslides on steep slopes in the Laramie Mountains along the Mountain Bell alternative.

### 3.2.3 Utah

Geology along the cable route in eastern Utah consists of Tertiary and Paleozoic sediments and Precambrian crystalline rock of the Wasatch Range. Geology along the cable route west of the Wasatch Front consists primarily of Quaternary alluvium that occupies large, block-faulted basins. The general low relief and aridity of the basins creates a low potential for landsliding along most of the cable route. No active slides have been mapped on the cable route. However, in the Wasatch Mountains, on the steep slopes adjacent to the cable route, a moderate to high potential for landsliding exists and many individual slides have been mapped. The most instable units are the mudstone, sandstone, marl, and conglomerate of the Tuffaceous Member of the Salt Lake Formation, located on the east end of Weber Canyon in Morgan County (Kaliser 1972).

### 3.2.4 Nevada

Geology along the cable route in Nevada consists of Paleozoic sediments and Tertiary tuffaceous deposits exposed in fault bounded tilted blocks that make up mountain ranges. Thick accumulations of Quaternary alluvium, deposited in north-south trending structural basins adjacent to the ranges, are also common along the cable route. Although relief along the proposed route ranges from flat to moderate, the semi-arid to arid climate of the region creates a low potential for landsliding. Cloudbursts are common in southern Nevada and result in heavy runoff and minimal saturation of hillsides. Such conditions favor debris flows that contribute to the formation of alluvial fans. Many alluvial fans are crossed by the cable route and occasional deposition from debris flows can be expected on these fans during high intensity, flash-flood-inducing storms. No active landslides have been mapped on the cable route. Slope failures are rare and limited to isolated adverse formations on steep slopes.

### 3.2.5 California

Geology along the proposed and alternative cable routes in California includes long, approximately north-south structural basins of Quaternary alluvium, corresponding fault bounded tilted blocks that expose rocks of all ages, the east-west Transverse Ranges of Precambrian and Mesozoic metamorphic rock, and the broad Los Angeles basin of thick alluvial deposits. Along both routes north of Cajon Junction (San Bernardino County), the arid climate and vast areas of low lying alluvium in the Mojave Desert make active landsliding extremely rare. Mass movement in the Mojave Desert is limited to isolated rockfall and debris flow. No active landslides have been mapped on either cable route north of Cajon Junction. In the Transverse ranges south of Cajon Junction the cable route goes through faulted and highly fractured rock, poorly consolidated alluvial gravels, and engineered slopes and fills. These adverse formations combined with the steep terrain create a moderate to locally high potential for landslides. The most instable unit in this area is the Pelona schist, located near Cajon Pass. Although no large active slides have been mapped on the cable route, some slides have been mapped in the hills adjacent to the route (Association of Engineering Geologists 1966).

## 3.3 SOILS AND RECLAMATION

### 3.3.1 Colorado and Wyoming

Soils within the states of Colorado and Wyoming crossed by the proposed route were characterized using the Colorado and Wyoming General Soil Maps, BLM resource documents, and contacts with BLM soil scientists. Soils within the two states vary widely with topography, elevation, and parent material and may generally be characterized as arid and variable structure. Soils in southwestern Wyoming are often characterized by high salinity and other soluble mineral content which has contributed, through erosion to pollution of major water resources in the area. Principal soil groupings are associated with mountain, upland, and alluvial plain topographic types. Soil types present within the

major topographic areas traversed by the proposed cable route are summarized in Table A-1 (Appendix A).

Mountain and mountain valley areas occupy 15 to 20 percent of the alignment in Wyoming. Developed on rolling to steep materials in the Laramie Mountains and the Bear River Divide, these soils are typically coarse, shallow, and subject to moderate to high water erosion, depending on runoff conditions and slope. Wind erosion potential is generally low but is moderate in some areas. Mountain soils on more gentle slopes are generally deep with low to moderate wind and water erosion potential.

Erosion hazards are located at several locations along the route where the line ascends and descends steep slopes. These are concentrated in the Laramie Mountains, Medicine Bow Mountains, Point of Rocks, Rock Springs, Green River, and the area surrounding Evanston from a point 15 miles to the foot hills of the Bear River Divide on the west.

Soils of the uplands are developed largely on bedrock-controlled benches, terraces, and alluvial outwash deposits and predominate throughout south-central Wyoming as well as northern Colorado. Slopes vary widely, are largely gentle to rolling but are steep in many places. These soils are mostly deep although shallow areas are extensive.

Saline/alkali soils are common in poorly-drained portions of the region and are extensive in the Bitter Creek drainage between Point of Rocks and Green River. Mapped water erosion potential is generally moderate and wind erosion potential is low to moderate except on the west slope of the Laramie Mountains and the north slope of the Medicine Bow Mountains where erosion potential is high.

Major alluvial deposits and related soils are located along major streams in the region including the Laramie and Little Laramie, Black's Fork Green, and Bear River valleys. These deep soils are generally subject to moderate water and low wind erosion. An extensive deposit of saline/alkali alluvial soils is located in the Rock Springs area.

Rehabilitation potential along the majority of the route is considered moderate and successful reclamation is anticipated.

The Mountain Bell alternative would traverse soils in the Cheyenne area that would be different than the proposed action. For approximately 25 miles from the Colorado border through Cheyenne to the foot of the Laramie Mountains, the route remains on the high plains soils of southeastern Wyoming. The high plains soils are generally very deep to the east, becoming more shallow as slopes steepen near the Laramie Mountains. The erosion hazard on these soils is moderate for both wind and water.

West of the Laramie Mountains in the Laramie and Medicine Bow River basins, the alternative is approximately 10 miles from the proposed alignment. However, soils in this area are substantially the same as along the proposed route, crossing mixed upland and alluvial soils as the basins are traversed. The alternative appears to cross slightly more alluvial soils than the proposed alignment.

### 3.3.2 Utah

The soils of the state of Utah are closely aligned with the physiography and climate of the state. Major areas crossed by the proposed route include the Wasatch Mountains and high uplands of north-central Utah, the alluvial plains of the Salt Lake and Jordan River drainages and the western desert in the Basin and Range province. Soils west of the Wasatch Range are general deep, arid, alluvial, and alkaline. Erosion hazards are generally moderate to low on the relatively gentle slopes along the proposed route; steep slopes in the Bear River, Lost Creek, and Weber River drainages are characterized by high potential for erosion. Table A-2 (Appendix A) summarizes important characteristics for soils crossed by the proposed route.

Soils in the Great Salt Lake and Jordan River plains are developed on lacustrine and fluvial deposits. These predominantly fine, loamy soils

are developed on level to gently sloping areas and are subject to moderate to low water erosion and low wind erosion potential. Soil alkalinity varies from none to strong. Where the line passes near Great Salt Lake, it crosses the nearly level saline playa area consisting of occasionally inundated deep clayey materials which exhibit salt deposits when dry. Wind erosion potential is high in this area.

Soils in the Western Utah Desert vary with the terrain. Soils on upland alluvial fans, mountain foothills, and dry desert valley bottoms occur extensively in Cedar and Rush valleys and in the Sevier and Escalante Desert areas. These deep, loamy, and often cobbly soils are located principally on smooth, undulating terrain with moderate to low wind and water erosion potential. These soils are often strongly alkaline. Wind erosion potential in this area is high on sandy and sand soil units located in the Rush Valley, critical in areas north and south of Lynndyl, and moderate in the Beaver River valley and areas south of Milford.

A substantial low-lying and saturated floodplain area is located along the Sevier River near Delta and Deseret. The water erosion hazard in this area of loamy soils is high due to bank cutting although wind erosion potential is moderate. The water table in this area is shallow and the alkalinity is variable.

Alkaline playa areas are extensive along the route south of Deseret in the south Sevier, Beaver, and Escalante valleys. Soils in these basin depressions are fine, very alkaline, and subject to moderate water and wind erosion levels.

Steep areas along the route in the desert area are limited. Desert mountain areas are limited to the Tintic Mountains crossings in Utah, Tooele, and Juab counties, and the southwest extreme of the line in Utah. Here, the soils are coarse and stony, shallow, and located on steep to very steep slopes.

Rehabilitation potential along the majority of the route through northern Utah is considered moderate and successful reclamation is anticipated. Rehabilitation potential on salilne/alkaline soils in arid regions of southern Utah is considered low.

### 3.3.3 Nevada

Soils crossed by the proposed corridor route in the State of Nevada are again closely related to the physiography and climate of areas to be crossed. Four major areas crossed by the proposed route are the Meadow Valley Area, Delamar Mountains and Valley Area, Coyote Springs Valley and Arrow Canyon Area, and Las Vegas Valley Area. Soils of the four areas vary with topography and parent material, and they may be characterized generally as aridic, poorly structured, and moderately susceptible to erosion. Table A-3 (Appendix A) summarizes important characteristics for soils to be crossed by the route.

The physiography of southern Nevada is dominated by a series of alternating, north-south trending desert mountains (low) and broad valleys. All four major areas are characterized by these features.

Soils of the desert mountains have developed principally in residual and alluvial materials occupying gently sloping to very steep terrain between rock outcrops. Soil surface textures are stony or gravelly sandy loams or loams. Erosion hazards stem principally from flowing water and the severity of soil loss is controlled principally by steepness and length of slope. The steeper and longer the slope, the higher the erosion potential.

Soils of the desert valleys have developed principally in alluvial materials which occupy upper and lower portions of the valley profiles. Upper alluvial deposits including high terraces and fans dominate the topography with minor occurrences of low hills and breaks. The upper valley soils occupy nearly level to moderately steep slopes and are dominated by textures of stony, cobbly, or gravelly sands, loamy sands,

and sandy loams. Erosion potentials for these soils generally range from low to moderate due to the coarse soil textures and the absence of steep, long slopes.

Lower alluvial deposits including low terraces and fans dominate the topography of the valley bottoms. Soils developing in these alluvial materials are deep to very deep and occupy nearly level to sloping surfaces. Erosion potentials are generally low to moderate due to the predominance of heavier soil textures of sandy loams, silt loams, and loams coupled with the absence of long steep slopes. However, areas occupied by soils more subject to wind erosion do occur along the route in the Las Vegas Valley Area. These soils have lighter soil textures of sands, loamy sands, and sandy loams. Desert pavement of stones, cobbles, and gravels cover the surface of most of these soils and protect the soil materials below. However, removal or disturbance of this protective cover exposes the erosive soils to wind action which may increase the potential for soil loss.

Areas of saline-alkali soils also occur in the valley bottoms. Salts leached from parent materials in higher elevations are carried by runoff waters along with soil fines and are deposited in low areas. These saline-alkaline soils are generally loamy soils with low to moderate erosion potentials.

Rehabilitation potential in the general region north of Las Vegas is considered moderate and successful reclamation is anticipated. Rehabilitation potential in southern Nevada on salilne/alkaline soils is considered low.

### 3.3.4 California

The proposed line route crosses three major physiographic and climatic regions within the State of California. The regions are the Mojave Desert, San Bernardino Mountains, and a portion of the Los Angeles Basin. Soils of all three regions vary with topography and parent

material. Desert soils can be characterized generally as aridic (thermic), poorly structured, and moderately to highly susceptible to erosion. Soils of the San Bernardino Mountains can be characterized generally as semi-arid (mesic), having more structural development in stable areas, having little structural development in alluvial deposits and on steeper slopes, and having moderate to high erosion potentials. The Los Angeles Basin soils can be characterized generally as semi-arid (mesic and thermic), having little structure, and moderately susceptible to erosion. Table A-4 (Appendix A) summarizes important characteristics for soils crossed by the proposed route.

Soils of the Mojave desert occupy two relatively distinct physiographic areas, uplands consisting of old terraces, alluvial fans, and low desert foothills and mountains and lowlands consisting of alluvial flood plains, terraces, fans, and basin rims. Upland soils have developed principally in alluvial and residual materials with textures generally of cobbly or gravelly sandy loams. These very shallow to very deep soils occupy nearly level to very steep slopes and are generally moderately susceptible to erosion. Lowland soils have developed principally in alluvial materials with textures ranging generally from loamy sands to silt loams. These shallow to very deep soils occupy nearly level to sloping surfaces and are moderately to highly susceptible to erosion. In addition, areas of saline or alkaline soils also occur in the desert lowlands. These soils are generally sandy or loamy in texture with moderate to high erosion potentials. Rehabilitation potential throughout the Mohave Desert is considered low and revegetation is not likely. Erosion potential would therefore be controlled by other erosion control methods discussed in Section 2.0.

Soils of the San Bernardino Mountains have developed in residual materials of mountain and foothill slopes and in alluvial materials of upland terraces and fans associated with mountain drainages. Soil surface textures are commonly sandy loams and these shallow to very deep mountain soils have moderate to high erosion potentials. The steepness

of slopes and the sandy textures of the mountain soils contribute to their moderate to high erodibility especially if disturbed.

Soils of the Los Angeles Basin encountered by the proposed route occupy lowland alluvial valley floors, fans, and terraces. Minor areas of steeper sloped hills are also likely to be crossed during construction. Soil surface textures are commonly loamy sands or sandy loams with variable amounts of stones, cobbles, or gravels present in the material. These deep to very deep soils have moderate to high erosion potentials which are governed by steepness of slope and the sandy surface textures of the soils.

## 3.4 WATER RESOURCES

### 3.4.1 Colorado and Wyoming

Within Colorado and Wyoming, the proposed right-of-way would cross 153 intermittent and 34 perennial creeks, streams, rivers, ditches, aqueducts, or other water drainages. This is based on review of BLM resource area maps. The major waterways that would be crossed include Lone Tree Creek, Laramie River, Browns Creek, Little Laramie River, Seven Mile Creek, One Mile Creek, Wagonhound Creek, Rock Creek, Medicine Bow River, North Platte River, Green River, Blacks Fork, and Bear River. The Mountain Bell alternative being considered in Wyoming would cross approximately 105 intermittent and 21 perennial creeks, streams, rivers, and drainages. It would cross the same major waterways listed above for the proposed route except for Brown's Creek, Seven Mile, and One Mile Creeks. (See Appendix D for a complete list of water resources crossed by the proposed and alternative right-of-ways.)

The project region drainages are characterized by high flows and low dissolved solids during periods of seasonal snowmelt and heavy rains. During other months, flows are relatively low (or nonexistent) with high dissolved solids. During nonspring months, groundwater becomes the primary contributor to flows of perennial streams. A number of

reservoirs have been constructed within basins crossed by the right-of-way, which help to regulate flows along some of the major rivers. Water quality concerns are generally increased sediment contribution, high mineral levels, and nutrient enrichment associated with human activities (oil and gas drilling, pipeline construction, and road construction), over-grazing, and natural erosion.

### 3.4.2 Utah

The proposed route would pass through Utah entirely within the Great Basin. Within this region, the route would cross the major basins of the Bear River, Weber River, Jordan River, and Sevier River drainages. Major creeks and rivers crossed in Utah include Lost Creek, Weber River, Jordan River, Sevier River, and Beaver River. A total of approximately 169 intermittent and 25 perennial rivers, creeks, streams, and drainages in Utah would be crossed by the right-of-way (refer to Appendix D).

### 3.4.3 Nevada

Within Nevada, 161 intermittent and 2 perennial draws, creeks, and washes would be crossed. The right-of-way would follow portions of Meadow Valley and Pahranagat Valley, and would pass well northwest of Lake Mead. The vast majority of mapped crossings are unnamed washes and draws that would hold water only during periods of heavy rains. A complete list of route crossings for Nevada is given in Appendix D.

### 3.4.4 California

The proposed cable route would pass through the arid region of the Mojave Desert and into the San Bernardino basin area bounded by the Transverse Ranges (San Gabriel Mountains). The most significant crossings are the Mojave River and the California Aqueduct. In all, 82 intermittent and 3 perennial drainages, washes, creeks, and rivers would be crossed by the proposed route (refer to Appendix D).

An alternative route segment (CalNev alternative) is being considered from the California-Nevada border into the Mojave Desert. This route

crosses 34 mapped intermittent drainages and washes (listed in Appendix D).

## 3.5 VEGETATION, LIVESTOCK, RANGE, AND GRAZING CAPACITY

### 3.5.1 Colorado and Wyoming

The proposed route crosses two major biotic communities, the Great Plains grasslands, and the Wyoming Basin, which contains typically Great Basin vegetation communities. About 95 percent of the route through Wyoming and Colorado crosses native vegetation, all of which has been disturbed to a varying degree by construction of the pipelines which the cable route would follow.

Most of the eastern 85 miles of the route crosses mid-grass prairie. The dominant species are perennial grasses such as blue grama, needlegrasses, and wheatgrasses, and other species such as sedges and fringed sage. The pass through the Laramie Range which reaches over 8000 feet elevation is predominantly grassland, although patches of conifer forest occur away from the right-of-way. About 7 miles of mountain mahogany shrub is crossed on the west side of the divide.

The western 265 miles of the route in Wyoming is predominantly in northern desert shrub communities. Sagebrush-grass is the most common vegetation type, dominated by big sagebrush, black sagebrush, low sagebrush, rabbitbrush, wheatgrasses, needle and thread, and other grasses. Other shrub communities include Gardner's saltbush on heavy alkaline soils, greasewood along many drainage bottoms, and mixed desert shrub including shadscale and spiny hopsage. Portions of the Red Desert have a very sparse vegetation cover.

Irrigated hayland and pasture occurs along many of the perennial streams crossed by the proposed right-of-way. Much of this is on river bottom land which would contain wet meadow or riparian vegetation under natural conditions, but is cultivated as native hay meadow (Appendix C).

Limited areas of riparian trees occur at the Bear River, Rock River, and other streams, along the channel and within the irrigated farmland (Appendix C). About 10 miles of the route crosses these irrigated areas.

Most of the route through Wyoming crosses lands used for grazing. A large number of grazing allotments for sheep and cattle are crossed. The average carrying capacity is estimated to be about 9 or 10 acres/AUM (animal unit month), with highest capacities in the east and lowest in the sparsely vegetated Red Desert.

Listed or proposed threatened and endangered species that may occur in the general region of the project have been identified by the U.S. Fish and Wildlife Service. None of these species are expected to occur within the existing right-of-way. Potential habitat for these species will be assessed and field surveys will be conducted if necessary to verify expected distribution.

The Mountain Bell alternative route crosses several miles of conifer forest on the west side of the Laramie Mountains. Important species include lodgepole pine, ponderosa pine, and grasses such as bluebunch wheatgrass, western wheatgrass, needle and thread, and Idaho fescue. The route crosses a well-developed riparian woodland at the Medicine Bow River in Wyoming. Irrigated hayland and pasture which may contain wet meadows are crossed for about 13 miles.

### 3.5.2 Utah

The proposed route crosses the western edge of the Wyoming Basin, the Wasatch Range, and the Great Basin. The principal vegetation types occurring along the route are pinyon-juniper, shadscale scrub, salt desert, and salt marsh in the Great Basin, sagebrush-grass in the Great Basin and Wyoming Basin, and Wasatch chapparal. About 80 percent of the route passes through native vegetation; the remainder crosses agricultural and developed areas.

Pinyon-juniper woodlands occur along approximately 16 miles of the route in the Tintic Mountains, and near the Nevada border. The most common species are Utah Juniper, pinyon pine, and big sagebrush. Sagebrush-grass covers about 100 miles of the route, mostly in the center part of the state from Lynndyl to Utah Lake, and also near the Wyoming and Nevada borders. Principal species include big sagebrush, rabbitbrush and other shrubs, perennial grasses in good condition areas, and cheatgrass in areas of poor range condition. The shadscale zone occupies valley bottoms principally from the Delta area south through the Escalante Desert. Vegetation in the Wasatch Range includes well-developed Gambel oak and bigtooth maple stands in some areas, and more open communities including mountain mahogany, big sagebrush, and perennial grasses.

The route passes near the Great Salt Lake and a playa south of Delta, for about 16 miles. Vegetation in these alkaline bottoms includes salt tolerant and wetland vegetation such as inland saltgrass, pickleweed, seepweed, greasewood, and other species. Limited areas of wet meadow may occur along the route near the Great Salt Lake. The route also crosses a diked area bordering the Sevier River for about one-half mile, where greasewood, tamarisk, and saltgrass are the predominant species. Irrigated agricultural land in the Lost Creek and Weber River valleys in northeastern Utah may include areas which would be wetlands under natural conditions (Appendix C). Limited areas of riparian vegetation also occur near the route in this area.

Much of the land along the route is used for grazing livestock. The average carrying capacity is expected to be about 14 acres per animal unit month (AUM).

No listed or proposed threatened or endangered species are expected to occur in the existing right-of-way. As discussed under Wyoming, this will be verified if necessary by field surveys prior to construction.

### 3.5.3 Nevada

The proposed route crosses two major biotic provinces, the Great Basin, and the Mojave Desert. The northeast 60 miles, about 28 percent of the route in Nevada, crosses Great Basin communities, and the remainder of the route is in the Mojave Desert. About 91 percent of the route crosses areas of native vegetation, the remainder consists of developed residential and commercial areas in Las Vegas.

The principal Great Basin vegetation types present on the route are pinyon-juniper woodlands and sagebrush-grass steppe. Pinyon-juniper woodlands occur along approximately 25 miles of the route through the Delamar Mountains, above 5000 feet elevation. Principal species include Utah Juniper, pinyon pine, big sagebrush, black sagebrush, bitterbrush, and grass species. The sagebrush zone occupies the lower foothills and valley slopes, and includes big sagebrush, black sagebrush, rabbitbrush, shadscale, and snakeweed.

The predominant vegetation type in the Mojave Desert is a low density and diversity community dominated by creosote bush and burro bush. Areas above 3500 feet elevation have a higher density and diversity mixed desert shrub community including Joshua tree, spiny hopsage, blackbrush, and other shrub species. The route crosses one barren playa, Delamar Lake for about 1 mile, and 5 miles of winterfat near the playa. A vegetated playa in Hidden Valley is crossed for about 5 miles.

No listed or proposed threatened or endangered plant species are known to occur on or near the proposed right-of-way. Seven candidate taxa could potentially occur (Table 3.5-1), all in the southern portion of the route in Clark County. The route crosses historic locations of the Las Vegas crypthantha on the north side of Las Vegas, and passes near populations of golden bear poppy near Las Vegas.

Livestock grazing occurs along most of the route in Lincoln County and about half of the route in Clark County. The average grazing

Table 3.5-1. SPECIAL STATUS PLANT SPECIES POTENTIALLY OCCURRING NEAR THE PROPOSED ROUTE (NEVADA)

| Species | Status* Federal | Status* Nevada | Habitat/Location |
|---|---|---|---|
| Cryptantha insolita<br>Las Vegas cryptantha | 1 | E | Formerly occurred on north side of city of Las Vegas, on saline clay soil with gypsum outcrops, 1-2000 feet elevation. May be extinct. |
| Ferocactus acanthodes<br>Barrel cactus | 2 | E | Associated with cresote bush; Clark County. |
| Astraqlus geyeri var triquetrus<br>Three-cornered pod<br>Geyer milkvetch | 2 | E | Sand or sandy soil on flats, dunes, washes, and gullies; 1500-2300 feet elevation; Clark County. |
| Calochortus striatus<br>Streaked mariposa lily | 2 | - | Alkaline meadows or seeps; 985-4500 feet elevation; Clark County. |
| Arctomecon californica<br>Golden bear poppy | 2 | E | Route passes near three known populations near Las Vegas. Occurs on barren, gravelly desert flats, hummocks, and slopes; 1310-2760 feet elevation; often in gypsiferous soils. |
| Penstemon bicolor ssp bicolor<br>Bicolored penstemon | 2 | - | On slight elevations, in shallow gravelly washes, roadsides, 1970-5480 feet elevation; Clark County. |
| Penstemon bicolor ssp roseus<br>Bicolored penstemon | 2 | - | On slight elevations, in shallow gravelly washes, roadsides, 1970-5480 feet elevation; Clark County. |

*Status:

Federal

1 = USFWS category 1 candidate species are those for which the USFWS presently has sufficient information available to support their listing as threatened or endangered.

2 = USFWS category 2 candidate species are those which the USFWS believes could probably appropriately be listed as threatened or endangered, but for which sufficient information is not presently available to biologically support a proposed rule.

State

E = Endangered

T = Threatened

capacity on BLM allotments is about 19 acres/AUM in Lincoln County; it should be noted, however, that this figure is derived from resources that are considerably better than 19 acres/AUM in some area (BLM 1982). In Clark County the average grazing capacity is about 120 acres/AUM (BLM 1979a). The highway from Utah to Panaca is a designated sheep trailing area.

### 3.5.4 California

The proposed route crosses two major biotic provinces, the Mojave Desert in the northern 157 miles (72%) of the route, and the California floristic province from Cajon Pass southward. Only about 185 miles (73%) of the route is in native vegetation, most of the area south of the San Gabriel Mountains and an area near Apple Valley has been developed for agricultural, residential, industrial, or similar uses.

Several vegetation communities occur within the Mojave Desert in the areas crossed by the proposed project. The most prevalent vegetation type is creosote bush scrub, dominated by creosote bush and burro bush. Desert washes throughout the area contain cheesebush, cassia, and other shrub species. Higher elevation area over 3500 feet in the Clark Mountains and in the area south of Apple Valley have a higher density and diversity mixed desert scrub community, including creosote bush, buckwheat, yucca, blackbrush, joshua tree, shadscale, mormon tea, and other species. The route passes near two playas, Silver Lake and Red Pass Lake, and the alkali scrub on the dry lake margins includes saltbush, pickleweed, and other salt tolerant plants. Desert grasslands with big galleta as the dominant species occurs east of Barstow.

The proposed route through the Cajon Pass area crosses about 15 miles of California chaparral, dominated by chamise, manzanita, ceanothus, and other evergreen shrub species. The remainder of the route south of Cajon Pass has largely lost its original vegetation, which included oak woodlands, chaparral, and coastal sagebrush communities.

Two unusual plant assemblages occur near the proposed route (BLM 1980a). The route through Keany Pass in the Clark Mountains is adjacent to the Clark Mountain ACEC (Area of Critical Environmental Concern). A proposed expansion of this area would put about 4 miles of right-of-way inside the ACEC (BLM 1986a). This management unit was established to protect the many endemic plants found on limestone in the Clark Mountains, to protect scenic values and to protect a white fir forest which occurs well away from the proposed right-of-way. The second area is the riparian community on the Mojave River south of Apple Valley.

About 70 miles of the route in the Mojave Desert is included in livestock grazing allotments. These include the area west from the Nevada border to near Baker, which is in two cattle perennial/ephemeral allotments, and the area from Barstow to Apple Valley which is in a sheep ephemeral allotment. The average carrying capacity of Mojave Desert grazing allotments is about 35 acres per animal unit month AUM (BLM 1980a).

No listed federal or state threatened or endangered plant species are known to occur in or near the proposed right-of-way. One state listed species, the threadleaf brodiaea, could occur near the route in the Cajon Pass area. One federal category 2 candidate species, Rusby's desert mallow, is known to occur adjacent to the right-of-way at Keany Pass. Eight other candidate species could potentially occur near the route at various locations (Table 3.5-2).

Two unusual plant assemblages occur on the CalNev alternative route (BLM 1980a). The Valley Well shadscale shrub assemblage in Shadow Valley is a Great Basin outlier, which intercepts the route for about 2 miles. About 4 miles of mesquite thicket occur near the Cronese area. A riparian area occurs on the Mojave River north of Victorville; no wetlands (except a playa at Ivanpah Lake) or other riparian areas are known to occur on the route.

Table 3.5-2. SPECIAL STATUS PLANT SPECIES POTENTIALLY OCCURRING NEAR THE PROPOSED ROUTE (CALIFORNIA)

| Species | Status* Federal | Status* Calif. | Location |
|---|---|---|---|
| Sphaeralcea rusbyi ssp eremicola<br>Rusby's desert mallow | 2 | - | Occurs adjacent to the cable right-of-way in Keany Pass area of Clark Mountains |
| Astragalus jaegerianus<br>Lane Mountain milkvetch | 2 | - | Occurs south side of Fort Irwin near route |
| Cympoterus deserticola<br>Desert cymopterus | 2 | - | Apple Valley area |
| Eriophyllum mohavense<br>Mojave woolly sunflower | 2 | - | Barstow area |
| Opuntia basilaris var brachyclada<br>Short-joint beavertail | 2 | - | Cajon Pass area |
| Eriastrum densifolium ssp sanctorum<br>Santa Ana River woolly-star | 1 | - | Cajon Pass area |
| Brodiaea filifolia<br>Threadleaf brodiaea | 2 | E | Cajon Pass area |
| Orthocarpus lasiorhynchus<br>San Bernardino owl's clover | 2 | - | Cajon Pass area |
| Centrostegia leptoceras<br>slender horned centrostegia | 2 | - | Cajon Pass area |

Table 3.5-2. SPECIAL STATUS PLANT SPECIES POTENTIALLY OCCURRING NEAR THE PROPOSED ROUTE (CALIFORNIA)

| Species | Status* Federal | Status* Calif. | Location |
|---|---|---|---|
| Galium californicum ssp primum California bedstraw | 2 | - | Cajon Pass area |

*Status:

Federal

1 = USFWS category 1 candidate species are those for which the USFWS presently has sufficient information available to support their listing as threatened or endangered.

2 = USFWS category 2 candidate species are those which the USFWS believes could probably appropriately be listed as threatened or endangered, but for which sufficient information is not presently available to biologically support a proposed rule.

State

E = Endangered.
T = Threatened.

About 65 miles of the route in the Mojave Desert is included in livestock grazing allotments. These include the area west from the Nevada border to near Baker, which is in two cattle perennial/ephemeral allotments, and the area from Barstow to Victorville which is in a sheep ephemeral allotment. The average carrying capacity of Mojave Desert grazing allotments is about 35 acres per animal unit month (AUM) (BLM 1980a).

No listed or proposed federal or state threatened or endangered plant species are known to occur in or near the CalNev alternative right-of-way. Seven federal candidate species might also occur near the route in various places, but are not definitely known to occur in or adjacent to the proposed right-of-way (Table 3.5-3).

## 3.6. WILDLIFE

### 3.6.1 Colorado

Big Game. Big game species that may occur in the Colorado portion of the proposed cable right-of-way include mule deer, whitetail deer, and pronghorn antelope. However, no critical habitat occurs within or adjacent to the right-of-way.

Aquatic Resources. No fishing resources of recreational, national, or state importance would be crossed by the proposed cable line in Colorado.

### 3.6.2 Wyoming

The proposed cable right-of-way would traverse several areas designated as critical winter range for mule deer, pronghorn antelope, and elk. These areas are located in the Medicine Bow, Divide, Green River, and Kemmerer BLM Resource Areas.

Mule deer critical winter range occurs in the Bengough Hill area, the region between Sheepherder Hill and Simpson Ridge, and in the area around Arlington. In addition, winter range is also present in the vicinity of

Table 3.5-3. SPECIAL STATUS PLANT SPECIES POTENTIALLY OCCURRING NEAR THE ALTERNATIVE ROUTE IN CALIFORNIA

| Species | Status* Federal | Calif. | Location |
|---|---|---|---|
| Erigeron parishii<br>Parish's daisy | 2 | - | Clark Mountains |
| Eriophyllum mohavense<br>Mojave woolly sunflower | 2 | - | Barstow area |
| Opuntia basilaris var brachyclada<br>Short-joint beavertail | 2 | - | Cajon Pass area |
| Eriastrum densifolium ssp sanctorum<br>Santa Ana River woolly-star | 1 | - | Cajon Pass area |
| Brodiaea filifolia<br>Threadleaf brodiaea | 2 | E | Cajon Pass area |
| Orthocarpus lasiorhynchus<br>San Bernardino owl's clover | 2 | - | Cajon Pass area |
| Centrostegia leptoceras<br>Slender horned centrostegia | 1 | - | Cajon Pass area |
| Galium californicum ssp primum<br>California bedstraw | 1 | - | Cajon Pass area |

*Status:

Federal

1 = USFWS category 1 candidate species are those for which the USFWS presently has sufficient information available to support their listing as threatened or endangered.

2 = USFWS category 2 candidate species are those which the USFWS believes could probably appropriately be listed as threatened or endangered, but for which sufficient information is not presently available to biologically support a proposed rule.

State

E = Endangered

T = Threatened.

Point of Rocks and the area west of Fort Bridger. Critical winter range traversed by the proposed right-of-way in Wyoming totals 36.9 miles.

Critical winter range for pronghorn antelope occurs in several areas extending from just west of the Laramie Airport to Arlington, from Wamsutter to Rock Springs, Green River, and Granger, in addition to areas along Black's Fork River. These areas comprise a total of 61.6 miles of critical winter range for pronghorn antelope.

Approximately 11 miles of elk critical winter range extends from northwest of Seven Mile Hill to Arlington and is primarily associated with the northern boundaries of Medicine Bow National Forest.

Big game summer and year-long range is also traversed by the proposed cable in several locations.

Upland Game Birds. Winter range for sage grouse is located near Simpson Ridge and extends for about 16 miles west to near the town of Walcott. Only one sage grouse lek has been identified along the proposed right-of-way (Beavers 1986). However, several strutting grounds are within 2 miles of the proposed cable right-of-way in the Medicine Bow Resource Area (Bloomquist 1986).

Raptors. A variety of raptors may occur along the proposed right-of-way, including the ferruginous hawk, red-tailed hawk, golden eagle, and prairie falcon. Ferruginous hawks are known to concentrate in an area immediately south of the right-of-way in the Divide Resource Area (Beavers 1986). A raptor nesting concentration area also occurs in the vicinity of Point of Rocks. Raptors nesting in this area include the golden eagle, prairie falcon, ferruginous hawk, red-tailed hawk, and great horned owl.

Threatened and Endangered Species. The United States Fish and Wildlife Service (Salt Lake City) has been contacted and a list of species that

could potentially occur on or near the entire proposed route will be assessed. Several species of wildlife listed under federal and state laws as endangered or threatened may occur in the vicinity of the proposed cable right-of-way, including the black-footed ferret, bald eagle, peregrine falcon, and Wyoming toad. The bald eagle and peregrine falcon are wide-ranging migrant species that may occur in the regions of the proposed right-of-way.

Black-footed ferrets may occur along portions of the right-of-way. The presence of prairie dog towns indicates a potential for the occurrence of this endangered species. Several recent confirmed sightings in Wyoming have been made in Sweetwater County (Raper 1986).

The Wyoming toad is considered a relict population that remained after the retreat of the glaciers, and has been found only in the Laramie Basin of Albany County. Habitats historically occupied by the Wyoming toad include floodplains, ponds, and small seepage lakes (Baxter and Stromberg 1980).

Aquatic Resources. Thirteen perennial streams that support sport fisheries would be crossed by the proposed line in Wyoming. Several game species are known to occur in these perennial streams (Table 3.6-1). Two of these streams, the North Platte River and the Green River, are considered to be Class I fisheries. A Class I value class is the highest-valued fishery resource based in the U.S. Fish and Wildlife Service rating system (USFWS 1978a) and is considered as a premium trout water and/or containing fisheries of national importance by the Wyoming Game and Fish Department (WGFD 1983). Rock Creek is the only stream listed as Class II. Class II designates a high-priority fishery resource rating by the USFWS, and is considered as a very good trout water and/or containing fisheries of statewide importance by the WGFD.

Several intermittent drainages would be crossed by the proposed cable route in Wyoming. None of these drainages are considered important in supporting recreational or commercially important fish species.

Table 3.6-1. SPORTFISH OCCURRING IN WYOMING STREAMS CROSSED BY THE PROPOSED CABLE ROUTE

| Stream | Class | Species |
|---|---|---|
| Lone Tree Creek | 4 | Brook Trout[F] |
| Little Laramie River | 4 | Rainbow Trout[S], Brown Trout[F], Brook Trout[F] |
| Brown's Creek | 4 | Rainbow Trout[S], Brown Trout[F] |
| Laramie River | 4 | Rainbow Trout[S], Brown Trout[F], Brook Trout[F] |
| Rock Creek | 2 | Rainbow Trout[S], Brown Trout[F], Brook Trout[F] |
| Sevenmile Creek | 4 | Rainbow Trout[S], Brook Trout[F], |
| Fourmile Creek | 4 | Brook Trout[F] |
| North Platte River | 1 | Rainbow Trout[S], Brown Trout[F], Brook Trout[F], Walleye |
| Medicine Bow River | 3 | Rainbow Trout[S], Brown Trout[F], Brook Trout[F] |
| Wagonhound Creek | 3 | Rainbow Trout[S], Brown Trout[F], Brook Trout[F] |
| Green River | 1 | Brown Trout[F], Kokanee[F], Machinaw[F], Channel Catfish |
| Black's Fork River | 3 | Rainbow Trout[S], Brook Trout[F], Cutthroat Trout[S] |
| Black's Fork River | 4 | No game species collected |
| Bear River | 3 | Bear River Cutthroat[S], Snake River Cutthroat[S] |
| <u>Mountain Bell Alternative</u> | | |
| South Fork Crow Creek | 5 | Brook Trout[F] |
| Laramie River | 3 | Rainbow Trout[S], Brown Trout[F], Brook Trout[F] |
| Fourmile Creek | 4 | Brook Trout[F], Sauger |
| Sevenmile Creek | 4 | Rainbow Trout[S], Brown Trout[F] |

Table 3.6-1. SPORTFISH OCCURRING IN WYOMING STREAMS CROSSED BY THE PROPOSED CABLE ROUTE (concluded)

| Stream | Class | Species |
|---|---|---|
| Cooper Creek | 5 | Brook Trout[F] |
| Dutton Creek | 4 | Brook Trout[F] |
| Rock Creek | 2 | Rainbow Trout[S], Brown Trout[F], Brook Trout[F] |
| Rock Creek | 2 | Rainbow Trout[S], Brown Trout[F], Brook Trout[F] |
| Foote Creek | 5 | Rainbow Trout[S], Brown Trout[F] |
| Wagonhound Creek | 4 | Rainbow Trout[S], Brown Trout[F], Brook Trout[F] |
| Medicine Bow River | 3 | Rainbow Trout[S], Brown Trout[F], Brook Trout[F] |
| Halleck Creek | 4 | Brook Trout[F], |
| Rattlesnake Creek | 4 | Brook Trout[F] |
| Pass Creek | 3 | Rainbow Trout[S], Brown Trout[F], Walleye |
| Pass Creek | 3 | Rainbow Trout[S], Brown Trout[F], Brook Trout[F] |
| North Platte River | 2 | Rainbow Trout[S], Brown Trout[F], Walleye |
| Green River | 1 | Brown Trout[F], Kokanee[F], Mackinaw[F], Channel Catfish |
| Black's Fork River | 3 | Rainbow Trout[S], Cutthroat Trout[S], Brown Trout[F], Brook Trout[F] |
| Black's Fork River | 3 | Rainbow Trout[S], Cutthroat Trout[S], Brown Trout[F], Brook Trout[F] |
| Bear River | 3 | Cutthroat Trout[S], Bear River Cutthroat Trout[S], Brown Trout[F] |

Source: Wyoming Game and Fish Department 1983.

F = Fall Spawner, October 1 - November 15.

S = Spring Spawner, April 1 - June 15.

Class III fishery resources that would be crossed in Wyoming include the Medicine Bow River, Wagonhound Creek, Black's Fork River, and the Bear River. A Class III fishery is considered a substantial fishery resource by the USFWS, and an important trout water and/or containing fisheries of regional importance by the WGFD. The seven remaining streams, Lone Tree Creek, Little Laramie River, Brown's Creek, Laramie River, Sevenmile Creek, Fourmile Creek, and Black's Fork River are considered Class IV fisheries. The Class IV rating is considered a limited fishery resource by the USFWS and a fishery of low production and/or containing fisheries that are frequently of local importance, and generally not capable of sustaining substantial fishing pressure.

The Mountain Bell alternative route deviates from the proposed route primarily in the Medicine Bow, Green River, and Kemmerer Resource areas. Within the Medicine Bow Resource Area, critical winter range is crossed for pronghorn antelope (37 miles), mule deer (33 miles), elk (6 miles), and sage grouse (12 miles). Approximately 7 miles of high-concentration raptor areas are traversed. Raptors common in these areas include the golden eagle, ferruginous hawk, prairie falcon, and sharp shinned hawk.

Within the Green River Resource area an additional 6 miles of critical winter range for pronghorn antelope is traversed and an additional 8 miles of elk and mule deer critical winter range is traversed near Point of Rocks. An additional 3 miles of pronghorn antelope critical winter range is traversed in the Kemmerer Resource Area.

Twenty perennial streams that support sport fisheries will be crossed by the Mountain Bell alternative route in Wyoming. Several game species are known to occur in these perennial steams (Table 3.6-1). The most valuable sport fisheries crossed by the line include the Green River, North Platte River, Rock Creek, Medicine Bow River, Black's Fork River, and Bear Creek.

3.6.3 Utah

Big Game. The vegetation types which occur along the proposed fiber optics corridor in Utah provide cover, foraging areas, and breeding ranges for several big game species, including mule deer, elk, moose, and antelope. Critical winter range traversed by the proposed cable occurs primarily in the region of Lost Creek in northeastern Utah between Lost Creek Reservoir and the Weber River. The approximate mileage of critical winter range for big game includes 22 miles for mule deer, 11 miles for elk, and 14 miles for moose, respectively (Wilson 1986). In addition, the proposed cable pathway is on the eastern edge of about 2 miles of critical antelope winter range in the BLM Warm Springs Resource Area and crosses about 9 miles of deer winter range in the BLM Pinyon Resource area. Big game summer and year-round range is also traversed by the proposed cable in several locations.

Raptors. (See Threatened and Endangered Species).

Threatened and Endangered Species. Two species of wildlife are listed under federal and Utah state laws as threatened, endangered, or protected. Species currently listed as endangered that may occur in the vicinity of the cable pathway include the bald eagle and peregrine falcon. Both species are wide-ranging, migrant species that may occur in various vegetation associations along the proposed corridor. Bald eagles are known to use a total of 34 miles of corridor in the Tooele and Warm Springs Resource Areas.

Aquatic Resources. Two perennial streams support cold-water game fisheries, and one perennial stream supports a warm-water game fishery. These would be crossed by the proposed cable line in Utah. Several game species are known to occur in these perennial streams (Table 3.6-2). The cold-water streams are Lost Creek and the Weber River. In the area of the proposed stream crossings, both are considered Class I, or the highest-valued fishery resources, by the USFWS, and Class II by the Utah Division of Wildlife Resources (UDWR 1983). The Class II state

Table 3.6-2. SPORTFISH OCCURRING IN UTAH STREAMS CROSSED BY THE PROPOSED CABLE ROUTE

| Stream | Class USFWS | Class UDWR | Species |
|---|---|---|---|
| Lost Creek | 1 | 2 | Rainbow Trout[S], Yellowstone Cutthroat Trout[S], Brown Trout[F], Arctic Grayling[S] |
| Weber River | 1 | 2 | Rainbow Trout, Yellowstone Cutthroat Trout[S], Brown Trout[F], Mountain Whitefish[F] |
| Sevier River | 4 | 4 | Walleye, White Bass |

Source: Utah Division of Wildlife Resources 1983.

F = Fall Spawner, October 1 - November 15.

S = Spring Spawner, April 1 - June 15.

classification lists these streams as waters of great importance to the state fishery in terms of aesthetics and recreation. These waters are large to moderate in size and may have some human development such as farms or commercial establishments adjacent to them (UDWR 1983).

Several intermittent drainages would be crossed by the proposed cable route in Utah. None of these drainages support recreational or commercially important fisheries.

The Sevier River would be crossed by the proposed fiber optic cable right-of-way and is considered a Class IV or limited fishery resource by the USFWS and the UDWR. The state classifies a Class IV stream as poor quality with limited fishery value that may be locally important for recreation where no other fishery exists.

### 3.6.4 Nevada

Big game species known to occur within or adjacent to the proposed route in Nevada include mule deer and bighorn sheep. Although the proposed right-of-way crosses approximately 9 miles of deer winter range, this range was not identified as critical (BLM 1979a). Bighorn sheep are present in the Las Vegas and Arrow Canyon mountains adjacent to the corridor and the proposed cable pathway traverses two bighorn migration routes between these mountain ranges (BLM 1982).

Raptors and Waterfowl. Bald eagles are known to winter in Pahranagat Valley. Additional species which occur throughout the region include prairie falcons and golden eagles, among others. Pahranagat National Wildlife Refuge is a primary waterfowl use area in the fall, winter, and spring.

Threatened and Endangered or Rare Species. Two species are classified as rare by the State of Nevada: the gila monster and desert tortoise. Although specific habitat for the gila monster has not been identified within the BLM Caliente or Clark County Resource Areas, this species

prefers rock or sand washes which are common along the proposed cable pathway route.

The proposed cable pathway crosses approximately 30 miles of crucial desert tortoise habitat located adjacent to Highway 93 in Lincoln and Clark counties and Interstate 15 in the Clark County BLM Resource Area (BLM 1982; Applied Conservation Technology 1983). Crucial habitat has been defined by the BLM as areas with 50 or more tortoises per square mile.

Bald eagles winter in the Pahranagat Valley and may be closely associated with the area around the national wildlife refuge located in the valley.

Aquatic Resources. No fishery resources of recreational, national, or state importance would be crossed by the proposed cable line in Nevada. Meadow Valley wash will be crossed four times between Panaca and Caliente. Meadow Valley is rated a Class IV stream (limited fishery) at these crossing by the USFWS. In addition, several intermittent drainages will be crossed by the proposed cable route. None of these drainages support recreationally or commercially important fish.

### 3.6.5 California

Big Game. Mule deer and bighorn sheep are expected to occur within or adjacent to the proposed route and the alternative route (I-15 corridor). The mule deer is expected to be present in the Clark, San Gabriel, and San Bernardino mountains which are adjacent to the preferred or alternate corridors. Nelson's bighorn sheep occur in many of the desert mountains adjacent to both corridors. Permanent bighorn sheep range occurs in the Clark Mountains near the California/Nevada border. Seasonal range includes the Mescal range and Soda Mountains. The preferred route also traverses two bighorn migration corridors; one route is located in the Clark Mountains, the other occurs in the Soda range.

Raptors. Golden eagles are resident species that are expected to occur along the entire preferred route. Ferruginous hawks are a common winter visitor in the desert regions. The Swainson's hawk, a threatened state species, may occasionally breed in the Mojave Desert; suitable nesting habitat may exist along the Mojave River near Victorville.

Threatened and Endangered. Several species of wildlife are listed as threatened or endangered, or are protected by state and federal laws. Three federal candidate species may occur within the vicinity of the proposed right-of-way and include gila monster, desert tortoise, and the yellow-billed cuckoo. In addition, the Least Bell's vireo is a California endangered species, federally listed as an endangered species as of May, 1986. State-listed threatened species include the Swainson's hawk, yellow-billed cuckoo, and Mojave ground squirrel. Species classified as sensitive by the BLM include the desert tortoise and desert bighorn sheep (BLM 1980a).

Several areas with moderate to high density desert tortoise populations are traversed by the proposed and alternative routes. These areas are in the region south of Baker near Soda Lake, and in Stoddard Valley.

The California yellow-billed cuckoo is a state-listed threatened species and may occur in dense riparian woodlands of the upper Mojave River. The Mojave ground squirrel, also a state-threatened species, uses a variety of habitat types except rock slopes and dry lake beds, and may be present in the area from Victorville to south of Hesperia.

The Least Bell's vireo is a California endangered species, federally listed as an endangered species as of May, 1986. Although suitable habitat may be available along the Mojave River or within the Cajon Canyon complex, the occurrence of this species along the proposed route is expected to be unlikely.

Aquatic Resources. The proposed cable route crosses the Mojave and Santa Ana rivers. However, neither river supports a substantial game fishery.

## 3.7 LAND USE

### 3.7.1 Colorado

The proposed cable route would be within existing right-of-way in Colorado. Only 2 miles of the route in Colorado are addressed here. Within the right-of-way the route traverses private and state lands.

Land Use and Land Cover Maps published by the U.S. Geological Survey were studied to identify the various land use categories traversed by the proposed cable route. The land use categories crossed by or adjacent to the proposed route are listed in Appendix F. This portion of the route travels through primarily herbaceous rangeland with some cropland and pasture.

There are no designated Wilderness Areas or Wilderness Study Areas near this portion of the route.

### 3.7.2 Wyoming

The proposed cable route would be within existing rights-of-way through the entire state. Within these rights-of-way, the proposed route would traverse primarily private land in the eastern portion of Wyoming with minor portions of Bureau of Land Management (BLM) and state lands. The proposed route would border the southwest corner of a portion of Medicine Bow National Forest. In the western portion of the state the proposed route traverses a checkerboard ownership pattern of BLM and private land except for an approximately 10-mile stretch of private land from Evanston to the Wyoming/Utah border. The proposed route also comes in close proximity to public water reserves approximately 15 miles east of Rock Springs and again approximately 5 miles west of Rock Springs.

The majority of the land traversed by the proposed route is rangeland, followed by agricultural land and barren land. Both sheep and

cattle graze on the rangeland. The urban or built-up land is primarily associated with the cities of Laramie, Rawlins, Rock Springs, Green River, and Evanston and also along the highways which the proposed route parallels. A complete list of land use categories traversed by this segment of the proposed route is provided in Appendix H.

The route does not cross or closely parallel any designated Wilderness Areas or Wilderness Study Areas in the state.

The Mountain Bell alternative route traverses approximately the same mix of land status as does the proposed route. One notable exception to this is the route's crossing of approximately 4 miles of U.S. Forest Service land in the Medicine Bow National Forest. The land use categories that this route crosses or closely parallels are the same as those for the proposed route. This alternative does not cross or closely parallel any designated Wilderness Areas or Wilderness Study Areas in the state.

### 3.7.3 Utah

The proposed cable route would be within existing rights-of-way through the entire state. Within these rights-of-way, the proposed route traverses primarily private land in the northern portion of Utah. The proposed route also traverses approximately 6 miles of Bureau of Reclamation lands, about 3 miles of U.S. Forest Service land (within a designated utility corridor in the Wasatch-Cache National Forest). The route also parallels the east side of the Little Sahara Recreation Area and crosses 7 miles of Bankhead-Jones Land Use lands to the northeast of the recreation area. The portion of the route from near the Camp Williams State Military Reservation southwest to the Utah/Nevada border is characterized by a checkerboard ownership pattern of BLM, private, and state lands.

The majority of the land traversed by the proposed route is rangeland, followed by agricultural land and transportation,

communications, and utilities land uses (see Appendix E). The urban or built-up land is associated with the area around Salt Lake City. The route does not cross or closely parallel any designated Wilderness Areas (or Wilderness Study Areas in the state).

### 3.7.4 Nevada

The proposed cable route would be within existing rights-of-way through the entire state. The largest category of land traversed would be Bureau of Land Management land, with some private land in Meadow Valley, Pahranagat Valley, and in the vicinity of Las Vegas. Other land status areas crossed or closely paralleled by the proposed route include the Key Pitman Wildlife Management Area, the Pahranagat National Wildlife Refuge, the Desert National Wildlife Refuge, and the Federal Agency Protective Withdrawal of Las Vegas Dunes Recreation Lands.

Within Delamar Valley the proposed route follows an existing transmission line right-of-way through approximately 30 miles of BLM-administered land. This route borders the western boundary of a portion of a Delamar Mountains Wilderness Study Area.

USGS Land Use and Land Cover Maps, the Clark County Grazing Environmental Impact Statement (BLM 1982), and the Caliente Environmental Statement (BLM 1979a) were reviewed to discern the various land use categories traversed by the proposed and alternative cable route. The vast majority of the land traversed by the proposed route is rangeland followed by barren land. Most of the urban or built-up land use categories crossed or paralleled by the route are associated with highways or the urban area of Las Vegas.

### 3.7.5 California

The proposed route in California traverses BLM land in southeastern California. South of Fort Irwin Military Reservation the land consists of a checkerboard ownership pattern of BLM and private land, except in the urban areas of Barstow, Victorville, and the area from San Bernardino

westward to Los Angeles, which are private lands. Other land status areas traversed by this route include approximately 4 miles through San Bernardino National Forest and about 2 miles of Bureau of Reclamation lands.

The urban or built-up land is primarily in the western part of the route and the rangeland is in the east. Cattle and sheep graze the rangeland in this area.

The land ownership along the CalNev alternative right-of-way is very similar to that of the proposed right-of-way. The differences are that this route crosses approximately 4 miles of dry Ivanpah Lake, borders the Yermo Area Marine Corps Supply Center, traverses approximately 9 miles of U.S. Forest Service land (San Bernardino National Forest), and crosses about 2 miles of Public Water Reserves land.

The land uses along the CalNev alternative route are also similar to that of the IPP route except that this route covers more rangeland than the IPP route. It also crosses or closely parallels some barren land (dry salt flats and strip mines, quarries, and gravel pits). This route also borders the Soda of Mountains Wilderness Study Area under appeal for approximately 25 miles and the Hollow Hills Wilderness Study Area designated as Further Planning or Study Area for about 5 miles.

## 3.8 CULTURAL RESOURCES

The discussion presented below is organized on the basis of the "culture areas" defined by Driver (1969), that are pertinent to the prehistory of the project area, rather than on the political state divisions. These culture areas used below are defined as follows:

> "Plains - This area stretches from central Alberta all the way south to the Mexican border. It is bounded on the west by the Rocky Mountains and on the east by the Missouri River.

Great Basin - All of Nevada and Utah and parts of California, Oregon, Idaho, Wyoming, and Colorado.

California - This culture are includes about two-thirds of the modern state of that name." (Driver 1969, pp. 20-21).

3.8.1 Northwestern Plains - Wyoming and Colorado

The cable route passes from northern Colorado through southern Wyoming, area commonly designated as falling within the Northwestern Plains cultural area. The cultural history of this region is long and varied. The prehistoric and historic aboriginal record has been subdivided by Frison (1978) into six periods as follows:

| | | |
|---|---|---|
| Paleo-Indian | 12,000+ | B.P. - 7,300 B.P |
| Early Archaic | 7,300 | B.P. - 5,000 B.P. |
| Middle Archaic | 5,000 | B.P. - 3,000 B.P. |
| Late Archaic | 3,000 | B.P. - 1,500 B.P. |
| Late Prehistoric | 1,500 | B.P. - 300± B.P. |
| Protohistoric | ca. 250 | B.P. - 100 B.P. |

The archeological record that correlates with this regional sequence begins with the big game hunters of the Paleo-Indian era who are noted for hunting postglacial period animals, such as mammoth and early bison that are now largely extinct. Paleoclimatic changes led to the introduction of modern mammals, such as bison, deer, and antelope, that are associated with the Archaic and more recent cultural manifestations. Throughout the sequence, settlement and subsistence patterns revolved around hunting of animals and collection of food plants on a seasonal basis and were characterized by seasonal movements of the human groups. As a consequence, common site types for the area include kill sites, short-term campsites, and larger, longer-term campsites. Special-use sites are also found, such as locales of lithic material quarries.

The historic period in northern Colorado and southern Wyoming includes both aboriginal and Euro-American components. Ethnohistoric

Indian groups known to have been in the area include the Kiowa, Comanche, Shoshone, Bannock, Arapahoe, Blackfoot, Cheyenne, Crow, Dakota, and Kiowa Apache. Cultural resource sites associated with these peoples usually consist of campsites that can be designated by the presence of distinctive artifact types and trade goods.

Euro-American intrusions into the region by commercial trappers and exploration parties began in the early 1800s. Subsequent historic themes in the area include emigration (for which Wyoming served as a corridor), military frontier, transportation/communication (roads, railroads, Pony Express, and telegraph), community life development, and resource utilization (minerals, grazing, gas and oil). Historic site types that may be encountered in the proposed cable route include roads, trails, cow camps, sheep camps, and possibly homesteads or ranches.

Cultural Resources Sensitivity. Previous work in the region has indicated that sites tend to cluster with availability of water, including drainages of all sizes, and critical economic plant, animal, and lithic resources. Locally, sites tend to be associated with certain topographic features such as ridge or knoll tops and slopes, benches, and on or near sand dunes on areas of desert pavement.

### 3.8.2 Great Basin - Utah and Nevada

The cable route in Utah and Nevada passes through the Great Basin culture area. Research has shown that this region was initially occupied by hunter/collector peoples of the Desert Archaic Tradition (ca. 9000-2500 B.P.), followed by the more sedentary Fremont groups (ca. 1500-700 B.P.). The Fremont are noted for their settled villages, ceramics, and a partial reliance on horticulture. After the disappearance of the Fremont, the region was occupied into historic times by the Shoshonean-speaking Ute bands and various Paiute groups. Site types associated with aboriginal occupation of the areas through which the route passes include limited activity areas or campsites, rock art, structural sites, and rock shelters.

Regional cultural resource overviews prepared for the Bureau of Land Management Salt Lake District (James and Singer 1980), Richfield District (Hull and Avery 1980), and Cedar City District (Thompson et al. 1983) generally indicate the following affiliations of known sites for the Salt Lake and Richfield Districts: Archaic - 4 percent; Fremont - 13 percent; Ute - 9 percent; and Unknown cultural affiliation - 75 percent.

The cultural sequence of the northern part of the Cedar City district, through which the cable route passes, is like that of northern and central Utah, with the addition of the Western Anasazi (ca. 1750-750 B.P.) and the predominance of Paiute occupation during the protohistoric period. However, sites affiliated with these two groups are expected to be rare in the project area.

The historic Euro-American period in Utah and Nevada began with Spanish explorations in the 1770s, followed by American exploration and trapping parties in the early 1800s. Settlement and colonization by the Mormons began in the mid-1800s, followed by various uses of the region's natural resources in the form of mining, ranching, and agricultural pursuits. Since the cable route principally follows established road corridors, historic sites expected to be encountered will be nonarchitectural. The primary historic site type anticipated will be campsites associated with early settlement of the region and ranching pursuits.

Cultural Resources Sensitivity. The Salt Lake and Richfield overviews also defined cultural resource sensitivity zones, based on the distribution of vegetation patterns. These sensitivity zones, which reflect the relative likelihood of encountering cultural resource sites, are as follows:

- Low Sensitivity Zone - Vegetation associations of salt grass, greasewood, shadscale, oak brush, and montane areas (aspen, fir, spruce, etc.)

- Medium Sensitivity Zone - Vegetation associations of sagebrush and horsebrush

- High Sensitivity Zone - Pinyon-juniper woodland association

It should be noted, however, that each zone contains great internal variability, and areas such as level ground, sand dunes, and around springs or waterways will probably yield higher site densities than other sectors of a given zone.

3.8.3 California - California

Once it leaves the Great Basin, the route of the proposed cable system, crossing what today is the Mojave Desert and traversing the San Bernardino Mountains before terminating in the Los Angeles Basin, is primarily within the California culture area (Driver 1969).

It is generally assumed that human occupation of the project area was occurring about 10,000 years ago, possibly even earlier. The prehistory of the Mojave Desert region has been divided into five periods:

| | |
|---|---|
| Early Systems Period | 50,000[?] B.P. - ca. 10,000 B.P. |
| Mojave I Period | 10,000 B.P. - 6,000 B.P. |
| Mojave II Period | 6,000 B.P. - 4,000 B.P. |
| Amargosa I | 4,000 B.P. - 1,500 B.P. |
| Late Prehistoric Period | 1,000 B.P. - historic contact |

These temporal divisions have been extrapolated from the archeological record, beginning with large stone chopping tools, hand axes, and flake tools thought to represent the earliest cultural manifestation (often called "Pre-Projectile Point Tradition.")

The Mojave I Period saw an emphasis on big game hunting and the use of food resources associated with now extinct lakes. Sites from this period tend to be large composites clustered around the lake shores, some

smaller satellite hunting camps and other specialized use areas such as quarry sites.

As people become more mobile and relied to a greater extent on seeds and small game their sites tended to be smaller and less permanent. Tools became more refined.

This pattern likely continued through the introduction of the bow and arrow and a period of increased dependence on plant foods. The Late Prehistoric Period saw the highly organized, seasonal use of plant food resources and concomitant elaborate processing tools and the introduction of pottery. The site pattern returns to sedentary, larger, general use sites.

The historic Indian groups occupying the study area in southern California were, from east to west, the Vanyume, Serrano, and Gabrielino people. With the exception of the more sedentary coastal people (Gabrielino), these Indian groups were semi-sedentary hunters and gatherers.

Historic Euro-American activity throughout the study region can be characterized thematically by the human endeavors that occurred there. They include Spanish exploration and settlement, fur trapping, settlement, government exploration, mining, railroads, ranching/farming, and Indian reservations.

Cultural Resources Sensitivity. Human positioning on the landscape is conditioned by needs for adequate life-space, protection from the elements, and locations of key survival resources; prehistoric archeological sites will be centrally located relative to these conditions. Sensitivity for the occurrence of cultural resources in the study region can be identified accordingly:

- Low Sensitivity Areas
  - Steep terrain
  - Barren desert
  - Areas of extensive urban development

- High Sensitivity Areas
  - Pinyon/Juniper and Oak Woodlands
  - Springs and watercourses
  - Lake margins and terraces
  - Alluvial fans
  - Dunes
  - Bedrock outcrops

## 3.9 SOCIOECONOMICS

The socioeconomic assessment for this project consists of an evaluation of the major cities and towns along the proposed route from which construction workers would seek temporary housing accommodations, food and other services during installation of the cable. The construction crews would consist of an average of seven workers for each 150-mile section of the proposed route. It is assumed that local hires would not be utilized due to the small number of crew members required. For this reason, local employment effects were not examined.

### 3.9.1 Colorado

The proposed cable route would traverse north central Colorado for approximately 2 miles from the intersection of Highway 25 and the Northwest Central Pipeline, northwest to the Colorado/Wyoming border. No large population centers exist in Colorado in close proximity to this portion of the route. The route would be serviced by Cheyenne, Wyoming (population 49,020) (Furtney 1986).

### 3.9.2 Wyoming

The proposed cable route would traverse southern Wyoming with an east-west trend. Six relatively large cities are along this route:

Cheyenne (population 49,020), Laramie (population 26,886), Rawlins (population 10,590), Rock Springs (population 18,386), Green River (population 12,127), and Evanston (population 10,486) (Furtney 1986).

### 3.9.3 Utah

The proposed cable route trends roughly north-south through Salt Lake City. The largest cities in the affected area include Salt Lake City (population 164,844), Ogden (population 68,183), Provo (population 74,138), and Orem (population 60,884). Smaller towns south of Provo include Delta (population 3025), Milford (population 1384), and Cedar City (12,333) (Gochnour 1986). Motel accommodations have been identified in Delta (seven motels with 190 units) (Hansen 1986), Milford (one motel with 25 units), and Cedar City (15 motels) (Tyler 1986).

### 3.9.4 Nevada

The proposed cable route trends roughly northeast-southwest through the southern portion of Nevada. The largest cities in the affected area are Las Vegas (population 193,052) and Henderson (population 37,046), near the California/Nevada border. Smaller towns to the north include Caliente (population 1170), Pioche (population 794), and Alamo (population 1126) (Walker 1986). Motel accommodations have been identified in each of these towns, with two motels in Pioche, five motels in Caliente, and one motel in Alamo (Cole 1986).

### 3.9.5 California

The proposed cable route trends roughly east-west through the southern portion of California. The largest cities in the affected area are Barstow (population 19,500), Victorville (population 20,250) and the numerous cities within the Los Angeles urban area (Lizon 1986). Baker (population 500) is located approximately midway between Barstow and Las Vegas. Motel accommodations in Baker have been identified as four motels, containing approximately 100 units (Clark 1986).

## 3.10 VISUAL RESOURCES

Visual resources are the physical characteristics of a landscape that determine its scenic quality and its value to the viewing public. These characteristics (e.g., topography, vegetation, water, and soils) are described objectively in terms of their cumulative contribution to the line, form, texture, and color of the landscape composition.

The main method and reference for identification of visual resources on this project is the Bureau of Land Management's Visual Resource Management (VRM) classification system (BLM 1979) and the U.S. Forest Service's Visual Quality Objectives (VQO) Visual Management System (USFS 1974). BLM and USFS have adopted these systems as a standardized procedure for identification, evaluation, and classification of visual resources for land management purposes. VRM classes are presented in Table 3.10-1 and VQO management levels are presented in Table 3.10-2.

### 3.10.1 Colorado

The short segment of cable alignment in Colorado would traverse rolling grasslands with little topographic diversity. The colors are predominantly related to the sage grasslands which vary seasonally from green to dusty gray-green. This rural setting can be characterized as being fairly common within the region, lacking unusual or unique landscape features.

### 3.10.2 Wyoming

The topography is variable, ranging from steep, rugged hills and mountains, towering rock formations, and timbered slopes; to meadowlands, rolling sagebrush grasslands, and flat bottomlands; to the high desert of the Great Basin Divide. Color varies from shades of brown, to the dusty gray-greens of sage grasslands and deeper greens of forested areas, to the red-browns of the Red Desert and Flaming Gorge vicinities.

Landscapes of scenic interest in the area include, from east to west, Medicine Bow National Forest, Little Laramie River, Medicine Bow River,

Table 3.10-1. VISUAL RESOURCE MANAGEMENT CLASSES FOR BUREAU OF LAND MANAGEMENT LANDS

| | |
|---|---|
| Class I | - This class primarily provides for natural ecological changes only. It is applied to primitive areas, some natural areas, and similar situations where management activities are to be restricted. |
| Class II | - Changes in any of the basic elements (form, line, color, or texture) caused by a management activity should not be evident in the characteristic landscape. |
| Class III | - Changes in the basic elements caused by a management activity may be evident in the characteristic landscape. However, the changes should remain subordinate to the visual strength of the existing character. |
| Class IV | - Changes may subordinate the original composition and character but must reflect what could be a natural occurrence within the characteristic landscape. |
| Class V | - This class applies to areas where the naturalistic character has been disturbed to a point where rehabilitation is needed to bring it back into character with the surrounding countryside. This class would apply to areas identified in the scenery evaluation in which the quality class has been reduced because of unacceptable intrusions. It should be considered an interim short-term classification until one of the other objectives can be reached through rehabilitation of enhancement. The desired visual quality objective should be identified. |

Source: Bureau of Land Management 1979b.

Table 3.10-2. VISUAL QUALITY OBJECTIVES FOR U.S. FOREST SERVICE LANDS

Preservation (P)
Provides for ecological changes only.

Retention (R)
In general, human activities should not be evident to the casual visitor.

Partial Retention (PR)
Human activities may be evident but must remain subordinate to the characteristic landscape.

Modification (M)
Human activities may dominate the characteristic landscape but must, at the same time, use naturally established form, line, color, and texture. Development should appear as a natural occurrence when viewed in the foreground or middleground.

Maximum Modification (MM)
Human activity may dominate the characteristic landscape but should appear as a natural occurrence when viewed as background.

Source: U.S. Forest Service 1974.

North Platte River, Great Divide Basin, the Continental Divide, Red Desert Basin, Bitter Creek, Green River, Blacks Fork, Muddy River, and Bear River.

The majority of the cable route traverses lands classified as VRM Class III. VRM classifications for regenerator stations are provided in Appendix B.

The Mountain Bell alternative would traverse the same counties and similar terrain as the proposed action. The major difference would be that the alternative would traverse portions of the Medicine Bow National Forest. The area that the route traverses has been classified as a rural area which has a substantially modified natural environment. The Visual Quality Objective is Partial Retention. Appendix B lists visual resource management classifications for the alternative regenerator stations.

### 3.10.3 Utah

The topography is characteristically mountainous thought the Wasatch Range in northeastern Utah to Salt Lake City. South and west of Salt Lake City the terrain is more typically basin and range, and semi-arid to arid with dry lake beds. Color along the northeastern route segment consists of green shades associated with timbered slopes, while the southern and western portion of the Utah route is visually dominated by browns and sandy shades, and dusty grey and green tones associated with desert vegetation.

Scenic landscapes in the vicinity of the proposed route include, from east to west, Wasatch National Forest, Lost Creek Reservoir, Great Salt Lake, Little Sahara Sand Dunes Recreation Area, and Escalante Desert.

The proposed cable route would traverse BLM lands with a VRM classification of Class IV. VRM classifications for regenerator stations are presented in Appendix B. Where the route traverses the Wasatch National Forest it would be within a utility corridor with a VQO level of M.

### 3.10.4 Nevada

The Nevada portion of the route is typically semi-arid to arid basin and range topography; color consists of shades of grays and browns, sandy tones, and dusty greens associated with sparse high-desert vegetation. Along its southern portion the route traverses the city of Las Vegas, a flat urban landscape.

Landscapes of scenic interest in the vicinity include, from northeast to southwest, Panaca Summit, Cathedral Gorge State Park, Kershaw-Ryan State Park, Oak Springs and Pahroc summits, Pahranagat lakes, Pahranagat National Wildlife Refuge, Desert National Wildlife Range, and Las Vegas Dunes Recreation Lands.

The proposed cable route would primarily be within BLM lands having a VRM classification of Class IV and Class III. Where the cable traverses the Pahranagat National Wildlife Refuge (approximately 2 miles) it would be on VRM Class II lands. The route would also be bordering the southwest boundary of the Delamar Mountains Wilderness Study Area (WSA) (Class II lands) but because it is within an existing right-of-way it would be on Class IV lands. Visual Resource Management classifications for regenerator stations are presented in Appendix B.

### 3.10.5 California

The proposed and alternative routes would cross arid desert landscapes, a topographic continuation of basin and range, through eastern California. Continuing west, the landscape becomes steep and mountainous, then traverses relatively level and increasingly urban terrain into the city of Los Angeles. Color ranges from desert browns, sandy tones, and dusty gray-greens, to greens associated with mixed pine and fir and chaparral forests.

Scenic landscapes in California include, from east to west, East Mojave National Scenic Area, California Desert Conservation Area, San Gabriel Mountains, San Bernardino National Forest, and Angeles National Forest (BLM, no date).

The proposed cable route would parallel the northern East Mojave National Scenic Area boundary for approximately 8 miles. As a National Scenic Area, the BLM manages the region to ensure the continuation of traditional uses which give the area its character, while retaining its natural scenic qualities. The route is also adjacent to a number of Wilderness Study Areas (refer to Section 3.7.5). Although VRM classifications have not been developed by BLM for the entire California Desert Conservation Area (BLM 1986a), VRM classifications were developed for the Mead/McCullough-Victorville/Adelanto Transmission Project (BLM and LADWP 1985), which assigned the East Mojave National Scenic Area and the Wilderness Study Areas a Class II rating. Management activities should not be evident in the characteristic landscape.

The proposed cable route would traverse the San Bernardino National Forest through the Cajon Pass. The cable would be within a utility corridor.

The CalNev alternative route would be within San Bernardino County, in the California Desert Conservation Area. Landscapes along the route would be similar to those described under the proposed action. The major difference between this alternative and the proposed action is that it would traverse the northern portion of the East Mojave National Scenic Area, paralleling the Interstate 5 right-of-way.

## 3.11 PALEONTOLOGY

Two segments of potential paleontological sensitivity along the proposed route have been identified. One segment includes approximately 48 miles of the route in Sweetwater County, Wyoming; the other segment includes approximately 19 miles of the Cajon Pass region of California.

### 3.11.1 Wyoming

In Sweetwater County, Wyoming the proposed cable route crosses the richly fossiliferous exposures of sedimentary bedrock in the Bridger

Basin. The route would traverse an area of paleontological sensitivity extending from 31 miles east to 16 miles west of Granger, Wyoming. In this area there are extensive exposures of the Tertiary-age Wasatch and Bridger formations, and Quaternary-age surficial deposits that are predominantly fluvial and alluvial. The Bridger Basin is known for having produced a high diversity and abundance of fossil mammals, reptiles, birds, fishes, and plants. In this area, 10 localities yielding significant vertebrate fossils have been recorded from within 1 mile of the cable route.

3.11.2 California

In the Cajon Pass area, the proposed route crosses approximately 19 miles of geological formations containing paleontological deposits. This segment extends from 10 miles north to a point 9 miles south of Cajon Junction. Cajon Pass lies in a mountainous region of complex geology. Structural disturbances such as faulting and folding have resulted in the close juxtapositioning of a number of different sedimentary units that range in age from sub-Recent to roughly 16 million years old. Many of these units represent fluvial and alluvial deposits known to preserve fossil vertebrates. Distributed throughout this region are deposits containing significant fossils that are preserved in abundance.

# 4.0
# ENVIRONMENTAL IMPACTS

Impacts resulting from the proposed action and alternatives were analyzed for the following resources:

- Geology
- Soils and Reclamation
- Water Resources
- Vegetation, Livestock, Range, and Grazing Rates
- Wildlife
- Land Use
- Cultural Resources
- Socioeconomics
- Visual Resources

Discussion of impacts is not repeated for alternatives except for those impacts that would differ from the proposed action. Impacts addressed in this section are those that would remain after implementation of the Applicant-committed practices included in Section 2.0. Any additional mitigation required would be included as stipulations and provisions to the Notices to Proceed for each BLM District Office and in special use permits for the Forest Service.

The following elements would not be impacted by implementation of the proposed project or alternatives, and are not discussed below: Wild and Scenic Rivers, Areas of Critical Environmental Concern, Wilderness Study Areas, Air Quality, and Prime and Unique Farmlands on public lands.

## 4.1 PROPOSED ACTION

### 4.1.1 Geology

Colorado and Wyoming. Over the majority of the route, grading and clearing would not be required. Other than the moderate potential for landslides in the Bear River Divide Region, a low potential for landslides exists along the remainder of the cable route in Wyoming. Placement of the cable (with a cable plow) within or adjacent to existing rights-of-way would minimize the potential for landslides because the existing right-of-way is stable. Applicant-committed practices listed in Section 2.0 would be applied if landslide potential were identified during construction.

Utah. Although a moderate to high landslide potential exists in the Weber Canyon area, slope stability problems would be limited by placement of the cable in existing rights-of-way and by employing the same procedures and practices described for Colorado and Wyoming.

Nevada. Over the majority of the route, grading and clearing would not be required. Along most of the cable route, landslide potentials are low and would be further minimized by the practices and procedures described above.

California. Although a moderate to high landslide potential exists in portions of the San Bernardino Mountains, slope stability would not be a problem owing to placement of the cable in existing rights-of-way and employment of the procedures and Applicant-committed practices referenced above.

### 4.1.2 Soils and Reclamation

Soil disturbance in plowed sections would be limited to a 6- to 8-inch-wide plowed area. Equipment movement would be expected to crush existing vegetation but not significantly affect soil structure or compaction. Additional disturbance would occur where trenching is

required or where dozer blading would be necessary to allow plow movement. Areas requiring rock sawing would be subject to similar levels of disturbance as for trenching. Trenching and blading impacts would be mitigated by measures specified in Appendix A and in specific Plans of Operation.

New soil disturbance would be limited by location of the line within already-disturbed pipeline rights-of-way. Soil structure or other characteristics are not expected to be significantly altered by either plowing or equipment track compaction, except in wet areas, addressed below. The potential for revegetation on disturbed soils along the route would vary with site-specific conditions (i.e., slope moisture content, texture, fertility, etc.), typically taking from one to five years.

Colorado and Wyoming. Construction of the Colorado and Wyoming portion of the line would involve a total potential disturbance area of about 840 acres within the 20-foot right-of-way. Areas requiring trenching would involve removal and nonselective replacement of all soil horizons, potentially resulting in inversion or mixing of soil horizons and subsequent productivity losses or the introduction of unsuitable subsoil materials (i.e., alkaline, calcic) to the seedbed. These impacts would be mitigated by appropriate reclamation and revegetation procedures addressed in Appendix A and Section 2.0.

Equipment movement, temporary access construction, and trenching activities would result in short-term streambank erosion. Construction in some wetland areas at crossings in clayey and saturated materials would not be initiated until soils have dried adequately to allow equipment operation without excessive soil compaction and rutting (Appendix A).

Utah. Construction of the Utah portion of the cable route would involve a total potential disturbance area of about 885 acres within the 20-foot right-of-way. All disturbed areas would be restored to their original

configuration following cable placement. Erosion control measures and required reclamation would be established as discussed previously for Colorado and Wyoming.

Equipment movement, temporary access construction, and trenching activities would result in short-term streambank erosion. Construction in wetland and alkaline playa areas, occurring near Great Salt Lake and at the Sevier River crossing, would involve potential compaction and would require additional grading to re-establish existing contours.

Nevada. Construction of the Nevada portion of the proposed route would involve a total potential disturbance area of about 550 acres within the 20-foot right-of-way. Disturbance of these areas may increase the potential for erosion; however, appropriate reclamation would reduce these impacts to insignificant levels. Erosion control measures and required reclamation for the proposed route are also specified in Appendix A.

Areas occupied by sandy soils in the Las Vegas Valley would be subject to increased wind erosion with the removal or disturbance of desert pavement cover.

California. Construction of the California portion of the proposed route would involve a total potential disturbance area of about 530 acres within the 20-foot right-of-way. Disturbance of these areas may increase the potential for erosion. However, appropriate mitigation would reduce these impacts to insignificant levels. Erosion control measures and required reclamation for the proposed route are also specified in Appendix A.

Erosion hazards along the route are low to high on level to very steep slopes along the route. The majority of areas with steep slopes will be avoided by following existing right-of-way that is located on level terrain. In a limited number of locations--e.g., the Cajon Pass

area of the San Bernardino Mountains--the proposed route would traverse steep-slope areas with high erosion potential. To prevent erosion impacts in these areas, Applicant-committed erosion control measures listed in Section 2.0 will be included in construction and operations plans for the USFS. Additionally, areas occupied by sandy soils in all three regions crossed in California would be subject to increased wind erosion with disturbance, particularly with the removal of desert pavement cover.

4.1.3 Water Resources

Colorado and Wyoming. The Applicant has proposed to cross the North Platte River and the Green River in Wyoming by trenching the cable into the streambeds. All other crossings would be via plowing, unless site-specific characteristics prevented the use of this method.

Based on the Applicant's proposed methods of stream crossings (see Section 2.3.5), long-term impacts to water resources would not be expected to occur. Short-term decreases in water quality due to increased sediment loads could occur due to disturbance of the streambed and channel during crossings. However, the increase in sediment loads would decrease to preconstruction levels following completion of construction and any necessary reclamation measures.

Utah. Because of its rocky streambed, the Weber River in Utah would likely be crossed using the trenching construction technique described previously in Section 2.3.5. All other stream, river, and drainage crossings would be crossed by plowing the cable into the streambed, unless site-specific conditions preclude using this technique. Expected impacts for Utah would be the same as those described above for Colorado and Wyoming.

Nevada. All stream, river, and drainage crossings in Nevada would be via plowing the cable into the streambed. Expected impacts for Nevada would be the same as those described above for Colorado and Wyoming.

California. Within California, the Applicant has proposed to cross the California Aqueduct, San Dimas Wash, and Big Dalton Wash using existing overcrossings (e.g., bridges). Where the route crosses the Mojave River, Cajon Canyon, and Cleghorn Canyon, the cable would be trenched (refer to Appendix D for crossing locations). All other crossings are expected to be by plowing the cable into the streambed, unless site-specific conditions prevent the use of this construction method. Expected impacts would be the same as those described above for Colorado and Wyoming.

4.1.4 Vegetation, Livestock, Range, and Grazing Rates

Colorado and Wyoming. Equipment used to install the cable would crush most vegetation within an 8-foot width and remove all vegetation within the plow/trench line. Clearing and grading should not be necessary in the remaining construction right-of-way, and removal of trees and brush would be minimal. The most common construction technique would consist of plowing the cable into the ground, which would cause vegetation removal in a narrow 6-inch wide zone. Vegetation on either side (approximately 8 feet wide) would be crushed under the treads of tires of the construction vehicles but should recover since the root systems would be intact. Greater disturbance of vegetation within the right-of-way would occur in areas where trenching is required (up to 3 feet wide), and in small areas at road, river, and railroad crossings, regenerator stations, and splice boxes. Total area of vegetation impact within an 8-foot width would be approximately 336 acres. For the regeneration stations, an area of approximately 20 x 25 feet would be disturbed. Total disturbance resulting from all the regeneration stations along the route would be less than 0.5 acre.

Approximately 24 acres of irrigated agricultural land which contains some wetland areas (Appendix C) would be within the proposed construction right-of-way. These areas are on private land, and construction and restoration techniques would follow landowners stipulations.

If the entire width of the construction right-of-way were disturbed in grazing areas, the forage lost temporarily before reclamation would be

about 60 AUMs. The actual amount lost should be substantially less because only a portion of the right-of-way would have vegetation removed.

No impacts would occur to any listed or proposed species because of the Applicant-committed procedures listed in Section 2.0. Summarized, these measures include (1) documentation of any species expected to occur within the right-of-way; (2) where potential habitat is present within the right-of-way, field surveys would be conducted to identify potential locations; and (3) proper avoidance procedures if species are located within the right-of-way.

Utah. As discussed above, equipment used to install the cable would crush most vegetation within an 8-foot width and remove all vegetation within the plow/trench line. Total area of vegetation impact would be approximately 354 acres.

Approximately 39 acres of wet alkaline areas would be within the construction right-of-way. These areas would require special construction techniques (described in Section 2.0 and Appendix A). Impacts on the vegetation of these areas are expected to be minimal and would be similar to those on the rest of the route. Wet meadows in the Lost Creek and Weber River valleys could be affected where the proposed route crosses irrigated meadows (Appendix C). These areas are on private land, and construction and restoration techniques will meet landowners specifications.

If the entire width of the construction right-of-way were disturbed in grazing areas, the total forage lost before reclamation would be about 50 AUMs. The actual amount lost should be substantially less because only a portion of the right-of-way would have vegetation removed.

No impacts would occur to any listed or proposed threatened or endangered plant species, as discussed under Wyoming.

Nevada. As discussed above for Colorado and Wyoming, equipment used to install the cable would crush most vegetation within an 8-foot width and remove all vegetation within the plow/trench line. Total area of vegetation impact would be approximately 220 acres. The total amount of forage lost before reclamation would be about 3 AUMs.

Approximately 10 acres of land currently used for irrigated agriculture which may be considered wetlands would be included in the construction right-of-way. The right of way would be within a highway right-of-way through these areas, so any disturbance would be at the edge of the wetlands. Impacts would be similar to vegetation impacts along the rest of the route.

No impacts to any listed or candidate threatened or endangered plant species would occur, as discussed under Wyoming.

California. As discussed above, equipment used to install the cable would crush most vegetation within an 8-foot width and remove all vegetation within the plow trench/line. Total area of vegetation impact would be approximately 212 acres. No significant impacts to vegetation in the two unusual plants assemblages are expected. No impacts to listed or candidate threatened or endangered species would occur because of the Applicant-committed mitigation discussed in Section 2.0 and under Wyoming.

If the entire width of the construction right-of-way were disturbed in the grazing allotments within the Mojave Desert, the total amount of forage lost before reclamation would be about 5 AUMs. The actual amount lost should be less in these areas. Some additional forage loss could occur on private land used for grazing.

4.1.5 Wildlife

Colorado. No impacts are anticipated for big game species in Colorado due to construction scheduling. No impacts are anticipated on intermittent drainages that would be crossed by the cable line in

Colorado because construction activities would occur during low-flow periods.

Wyoming.

Impacts. Construction and installation of the cable, electrical distribution line, and other project-related facilities would be completed before November 15, 1986, and therefore would not disturb big game use of winter range.

Temporary loss of habitat on summer or winter range would not constitute a significant impact because mule deer, pronghorn antelope, and elk have large summer and winter ranges, and the area of disturbance for cable installation and related facilities would not comprise a significant portion for any species. As grass and shrub species are restored, wildlife species may be attracted to the corridor and may be expected to again use the right-of-way vegetation as a food source.

Installation of the cable would not affect sage grouse strutting activities because installation would not begin until after the breeding period for sage grouse (April-May).

Threatened and Endangered Species. The proposed cable and related facilities right-of-way is within the distribution range of federal- and state-listed endangered and threatened species (black-footed ferret, peregrine falcon, bald eagle, and Wyoming toad). However, the proposed construction and installation would not have any adverse or unavoidable impacts due to the linear nature of the proposed project and minimal acreage disturbance. Further, surveys conducted for this environmental assessment would identify any previously unknown threatened or endangered species habitat and proper avoidance procedures would be taken. Applicant-committed practices are detailed in Section 2.0, and stipulations of those agreements will be included in Plans of Development and/or Notices to Proceed for each BLM District Office and Special Use Permits for each Forest Service Ranger District.

Aquatic Resources. Installation of the cable at stream crossings would cause a short-term increase in the turbidity levels in perennial streams. These short-term increases in turbidity are not expected to significantly affect fishery resources because of Applicant-committed practices detailed in Section 2.0. The effects of relatively long-term or heavy silting are known to cause egg mortality and physiological damage to young and adult fishes and benthic organisms (Gammon 1970). However, fish reportedly tend to avoid turbid waters when possible, and available information suggests fingerling and adult fishes are tolerant to temporary periods of increased sedimentation that would result from the proposed action.

No impacts are anticipated on intermittent drainages that will be crossed by the cable line in Wyoming because construction activities will occur during low-flow periods.

Utah.

Impacts. Installation and operation of the cable would not result in significant impacts to big game, raptors, and upland game as discussed above for Wyoming. Impacts are not expected in high-use bald eagle winter habitat within the Tooele and Warm Springs Resource Areas or Weber Canyon because installation of the cable would not occur during winter months.

Threatened and Endangered Species. The proposed cable right-of-way is within the distribution range of federally and state-listed endangered and threatened species (peregrine falcon and bald eagle). However, they would not be affected for reasons discussed above for Wyoming.

Aquatic Resources. For the reasons discussed above for Wyoming, short-term increases in turbidity are not expected to cause significant impacts to aquatic resources. No impacts are anticipated on intermittent drainages that will be crossed by the cable line in

Utah because construction activities would occur during low-flow periods.

Nevada.

Impacts. Installation and operation of the cable and related facilities would not result in significant impacts to big game, raptors, and upland game for reasons discussed above.

Threatened, Endangered, and Rare Species. Applicant-committed practices in Section 2.0 include two measures to avoid impacts in desert tortoise crucial areas:

- Avoid installation during tortoise active period (April-September).

- Provide a qualified biologist to clear the right-of-way ahead of installation equipment.

Given these measures, no significant adverse impacts would occur.

Aquatic Resources. For reasons discussed above for Wyoming, short-term increases in turbidity are not expected to cause significant impacts to aquatic resources. No impacts are anticipated on the intermittent drainages in Nevada if construction activities occur during low-flow periods.

California.

Impacts. Installation and operation of the cable would not result in significant impacts to big game, raptors, and upland game (as discussed above for Wyoming).

Threatened and Endangered Species. Although the proposed cable right-of-way is within the distribution range of several federal- and state-listed endangered and threatened species (desert tortoise,

California yellow-billed cuckoo, Least Bell's vireo, Mohave ground squirrel, Swainson's hawk) the proposed construction and installation would not be expected to have any adverse or unavoidable impacts given Applicant-committed practices detailed in Section 2.0.

Aquatic Resources. For reasons discussed above for Wyoming, short-term increases in turbidity are not expected to cause significant impacts to aquatic resources. No impacts are anticipated on intermittent drainages that will be crossed by the cable line in California if construction activities occur during low-flow periods.

4.1.6 Land Use

Colorado. Construction and operation of the proposed cable would have no significant impacts on existing land uses along the right-of-way. The construction and operation of the cable would be in conformance with all pertinent existing BLM land use plans according to BLM and USFS personnel contacted and review of all applicable management framework plans and grazing environment impact statements. Applicable management framework plans and grazing environmental impact statements that were reviewed are included in Section 6.0. The brief presence of construction crews and equipment along the right-of-way would not interfere significantly with other uses.

Wyoming. Construction and operation of the proposed cable would have no significant impacts on existing land uses along the right-of-way within Wyoming due to the reasons discussed under Colorado. The construction and operation of the cable would be in conformance with all pertinent existing BLM land use plans.

Utah. Construction and operation of the proposed cable would have no significant impacts on existing land uses along the right-of-way within Utah due to the reasons discussed under Colorado. A small segment of the route would be outside the Pinyon Management Framework Plan utility corridor; however, this segment would not be inconsistent with the

overall objectives of the land use plan. Where the cable is within the corridor, the construction and operation of the cable would be in conformance with the pertinent existing BLM land use plans. The right-of-way through the Wasatch National Forest is within a U.S. Forest Service approved utility corridor. Therefore, the construction and operation of the cable would be subject to the standards and guidelines as included in the Wasatch-Cache National Forest Land and Resource Management Plan.

Nevada. Construction and operation of the proposed fiber optic telecommunications cable would have no significant impacts on existing land uses along the proposed right-of-way in Nevada due to the reasons discussed under Colorado. The construction and operation of the cable would be in conformance with all pertinent existing BLM land use plans. The construction and operation of the proposed cable would also be compatible with objectives, regulations, and goals for the Desert National Wildlife Refuge and the Pahranagat National Wildlife Refuge.

California. Construction and operation of the proposed fiber optic telecommunications cable would have no significant impacts on existing land uses along the proposed route in California due to the reasons discussed under Colorado. The construction and operation of the cable would be in conformance with all pertinent existing BLM land use plans and would be within an approved utility corridor. The right-of-way through the San Bernardino National Forest is within a U.S. Forest Service approved utility corridor. Therefore, the construction and operation of the cable would be in conformance with existing San Bernardino National Forest Service Land and Resource Management Plans.

4.1.7 Cultural Resources

Colorado, Wyoming, Utah, Nevada, and California. The Applicant has committed to the measures listed in Section 2.0 for cultural resources. These measures would prevent the loss or physical disturbance of cultural resources during construction. In addition, unauthorized collecting of

artifacts during project construction and operation would be prohibited, and measures would be taken to prevent identified sites from becoming public knowledge.

The indicators for evaluating the potential significance of impacts on cultural resources are set forth in federal regulations (36 CFR 800.3). An effect is considered significant under the federal regulations when an undertaking changes the integrity of location, design, setting, materials, workmanship, feeling, or association of the property; i.e., modifies those attributes that contribute to the resource's significance in accordance with National Register of Historic Places criteria. Criteria for judging an effect to be adverse include:

- Destruction or alteration of all or part of a property
- Isolation from or alteration of the property's surrounding environment
- Introduction of visual, audible, or atmospheric elements that are out of character with the property or alter its setting
- Neglect of a property resulting in its deterioration or destruction
- Transfer or sale of a property without adequate conditions or restrictions regarding preservation, maintenance, or use

Impacts are considered significant if there is a reasonable probability that a resource eligible for the National Register of Historic Places could be damaged or destroyed as a result of the proposed action, and if provisions have not been made to mitigate those adverse effects. Impacts to traditional Native American sites are considered significant if they meet similar criteria.

4.1.8 Socioeconomics

Colorado and Wyoming. It is assumed that Cheyenne, Laramie, Rawlins, Rock Springs, Green River, and Evanston (populations from 10,000 to 49,000) would support housing accommodations, food, and services for an average of seven workers on the construction crew, with no more than one crew expected to be in any city at any given time. In addition, the maximum distance between two identified cities is 100 miles between Rawlins and Rock Springs, creating a maximum commuting distance of 50 miles each way, for any point on the proposed cable route in Colorado or Wyoming.

It is not considered likely that the demands for housing and services by project construction workers would exceed supplies in the project area. Since the number of workers associated with project construction in any one area would be fairly small, adequate existing housing and services are expected to be available. In addition, a construction spread would be located in a specific area for a maximum of approximately 4 to 6 weeks. Therefore, demands for housing and services would be of short duration and no impacts would occur.

Utah. The largest cities along the proposed route include Salt Lake City, Ogden, Provo, and Orem. It is assumed that cities of this size (population 60,000 to 164,000) would support housing accommodations, food, and services for an average of seven workers on the construction crew, with no more than one crew expected to be in any city at any given time. South of Provo, smaller towns are located along the proposed route. Adequate temporary housing accommodations have been identified in Delta, Milford and Cedar City. The maximum distance between two identified cities is 80 miles between Provo and Delta, creating a maximum commuting distance of 40 miles each way, for any point on the proposed cable route in Utah.

Based on the small number of construction workers, the number of cities along the route and their associated accommodations and services available to the workers, no socioeconomic impacts are expected.

Nevada. The largest cities along the proposed route include Las Vegas and Henderson in the southern portion of Nevada. It is assumed that cities of this size (population 193,052 and 37,046, respectively) would support housing accommodations, food, and services for an average of seven workers on the construction crew, with no more than one crew expected to be in any city at any given time. North of these cities, smaller towns are located along the proposed route. Adequate temporary housing accommodations have been identified in Caliente, Pioche, and Alamo. The maximum distance between two identified cities is 110 miles between Alamo and Las Vegas, creating a maximum commuting distance of 55 miles each way, for any point on the proposed cable route in Nevada. The distance between Pioche or Caliente and Cedar City, Utah, is 90 miles.

Based on the small number of construction workers, the number of cities along the route and their associated accommodations and services available to the workers, no socioeconomic impacts are expected.

California. The largest cities along the proposed route include Barstow, Victorville, and the Los Angeles urban area in the southern portion of California. It is assumed that cities of this size (population of at least 19,000) would support housing accommodations, food, and services for an average of seven workers on the construction crew, with no more than one crew expected to be in any city at any given time. East of Barstow, Baker is located along the proposed route. Adequate temporary housing accommodations have been identified in Baker. The maximum distance between two identified cities is 90 miles between Baker and Las Vegas, creating a maximum commuting distance of 45 miles each way, for any point on the proposed cable route in California.

Based on the small number of construction workers, the number of cities along the route and their associated accommodations and services available to the workers, no socioeconomic impacts are expected.

4.1.9 Visual Resources

The analysis of consequences was based on the BLM Visual Resource Management (VRM) and the USFS Visual Quality Objectives (VQO) systems for inventorying and evaluating visual resources, and for determining the degree of landscape contrast acceptable within a given location. Adverse visual consequences occur where the proposed action or alternatives would significantly contrast with existing landscape features (line, form, texture, and color) and would not conform to BLM or USFS management policies.

The use of revegetation, construction, and restoration methods (described in Section 2.3.8.7) were considered in the analysis. It is important to note that the normal method of cable placement would be plowing and that the soil is not turned over or removed and the only direct disturbance is the narrow strip from the 2-inch-wide plow blade. Consequently, the resulting surface scar which could introduce an unnatural line (the ROW) across the landscape, potentially contrasting with existing landscape features, would be small and not very noticeable. Additionally, because the cable route would be following existing right-of-ways which have been previously disturbed, contrasts relating to vegetation removal would be minimal. This visual analysis, therefore, focuses on the contrast resulting from the construction of regenerator stations, junction stations, transmission line poles, and access roads.

Colorado, Wyoming, Utah, Nevada, and California. On public lands, the regenerator stations, junction stations, transmission line poles, and access roads would be located within BLM VRM Class III and IV lands. For these management classes human activities may be evident but must remain subordinate to the characteristic landscape. The project components, due to their size and dimensions and their locations within landscapes not considered to be unique or outstanding, would not contrast significantly with characteristic landscapes and therefore would conform with the Visual Resources Management Classes. Project components, other than the

cable line, would not be located on USFS lands. The cable line would conform with Forest Service Visual Quality Objectives for Weber Canyon.

4.1.10 Paleontology

The Applicant has committed to the measures listed in Section 2.0 for paleontological resources. These measures would prevent the loss or physical disturbance of such resources during construction. In addition, unauthorized collecting of specimens during project construction and operation would be restricted, and measures would be taken to prevent identified sites from becoming public knowledge.

## 4.2 MOUNTAIN BELL ALTERNATIVE

### 4.2.1 Soils and Reclamation

Colorado and Wyoming. Soils impacts are expected to be comparable to the proposed route. The alternative is shorter but steeper, has fewer rock outcrops, and the overall erosion hazard is lower.

### 4.2.2 Vegetation, Livestock, Range, and Grazing Rates

Colorado and Wyoming. The right-of-way traverses conifer forest in eastern Wyoming. However, removal of timber would not be necessary because any trees that have reinvaded the existing right-of-way would be avoided. Riparian woodlands near the Medicine Bow River would be protected by measures in Section 2.0.

### 4.2.3 Visual Resources

Colorado and Wyoming. The Mountain Bell alternative would need to meet USFS Standards and Guidelines for the partial retention Visual Quality Objectives.

## 4.3 CALNEV ALTERNATIVE

### 4.3.1 Vegetation, Livestock, Range, and Grazing Rates

No impacts to listed threatened or endangered plant species are expected to occur since none are known to be present along the

right-of-way. Construction across Ivanpah Lake is not expected to result in significant impacts since the lake would be dry during construction. Total area of vegetation impact would be approximately 228 acres.

## 4.4 NO-ACTION ALTERNATIVE

This alternative would not result in any environmental impacts. The Applicant would not be allowed to extend its existing telecommunications network.

5.0

# CONSULTATION AND COORDINATION

## 5.1 AGENCIES AND ORGANIZATIONS CONSULTED

### 5.1.1 Federal

- U.S. Department of Interior

  Bureau of Land Management

  Rawlins District
  - Medicine Bow Resource Area
  - Divide Resource Area

  Rock Springs District
  - Green River Resource Area
  - Kemmerer Resource Area

  Richfield District
  - Warm Springs Resource Area
  - House Range Resource Area

  Cedar City District

  Las Vegas District
  - Stateline Resource Area
  - Caliente Resource Area

  Salt Lake City District
  - Bear River Resource Area
  - Pony Express Resource Area

  California Desert District
  - Barstow Resource Area
  - Needles Resource Area

U.S. Fish and Wildlife Service
Helena Regional Office
Denver Regional Office
Salt Lake City Regional Office

United States Geological Survey
Menlo Park, CA

- U.S. Department of Agriculture

Soil Conservation Service

Denver State Office

Casper State Office
Cheyenne Area Office

Salt Lake City State Office
Cedar City Area Office

Carson City State Office

Sacramento State Office
Escondido Area Office
Apple Valley Area Office
Redlands Area Office

U.S. Forest Service

Medicine Bow National Forest
Wasatch - Cache National Forest
San Bernardino National Forest

5.1.2 State

Wyoming

- State Planning Office, Research and Statistics
- State Department of Environmental Quality, Land Quality Division
- Wyoming Game and Fish Department

Utah

- State Planning Office, Data Resources
- Department of Transportation
- Geological and Mineralogical Survey
- Utah State Division of Wildlife Resources

Nevada

- Community Services (State Clearinghouse)
- Nevada Department of Wildlife

California

- State Department of Finance, Population Research
- California Fish and Game Department

5.1.3 Local

Wyoming

- Chamber of Commerce, Rawlins

Utah

- Five-County Association of Governments
- Six-County Association of Governments

Nevada

- Lincoln County Clerk's Office

California

- Chamber of Commerce, Baker
- San Bernardino County Geologist
- San Bernardino County Planning Department

## 5.2 LIST OF PREPARERS

Bureau of Land Management

Dan Naegle
Salt Lake District Office
Project Manager

Ron Bolander
Utah State Office

Terri Yeckley
Salt Lake District Office
Environmental Coordinator

Woodward-Clyde Consultants

Steve Kellogg
Project Manager

Brenda Peters
Assistant Project Manager, Visual Resources Task Leader

Vance Bente
Assistant Project Manager, Cultural Resources Task Leader

Kurt Fraese
Geology Task Leader

Richard Bell
Soils and Reclamation Task Leader

Jeff Zimmerman
Water Resources Task Leader

Jeff Dawson
Vegetation, Livestock, Range, and Grazing Rates Task Leader

Ron Freeman
Wildlife Task Leader

David Fee
Land Use Task Leader

Catherine Helseth
Socioeconomics Task Leader

6.0

# BIBLIOGRAPHY

Anderson, L.R., et al. 1983. The Utah Landslides, Debris Flows and Floods of May and June 1983. Committee on Natural Disasters. 93 pp.

Applied Conservation Technology, Inc. 1983. Intermountain Power Project (IPP) ± 500 kV DC Intermountain-Adelanto Line 1, Nevada Portion, Desert Tortoise Inventory and Significance Evaluation. Final Report. Prepared by A. Karl and E.L. Smith. Submitted to City of Los Angeles, Department of Water and Power. January.

Association of Engineering Geologists. 1966. Engineering Geology in Southern California. AEG Special Publication 389.

Bagley, D.G. 1980. Soil Survey of Virgin River Area, Nevada-Arizona. Parts of Clark and Lincoln Counties, Nevada, and Part of Mohave County, Arizona. U.S. Department of Agriculture Soil Conservation Service, in cooperation with U.S. Department of the Interior Bureau of Land Management, University of Nevada Agricultural Experiment Station, and University of Arizona Agricultural Experiment Station.

Baxter, G.T., and M. Stromberg. 1980. Status Report for the Wyoming Toad. Denver, CO: U.S. Fish and Wildlife Service.

Beavers, T. (Bureau of Land Management Divide Resource Area, Rawlins). 1986. Personal communication. April 15.

Bender, G.L. (ed.). 1982. Reference Handbook on the Deserts of North America. Westport, Connecticut: Greenwood Press.

BLM. See Bureau of Land Management.

Bloomquist (Bureau of Land Management Medicine Bow Resource Area, Rawlins). 1986. Personal communication. April 16.

Borup, H.J., and D.G. Bagley. 1976. Soil Survey of Meadow Valley Area, Nevada-Utah. Parts of Lincoln County, Nevada, and Iron County, Utah. Produced by U.S. Department of Agriculture, Soil Conservation Service, and U.S. Department of the Interior, Bureau of Land Management, in cooperation with the University of Nevada Agricultural Experiment Station and the Utah Agricultural Experiment Station.

Brown, D.E. (ed). 1982. "Biotic Communities of the American Southwest--United States and Mexico." Desert Plants 4(1-4):1-342.

Brown, D.E., and C.H. Lowe. 1980. Biotic Communities of the Southwest (map). USDA Forest Service General Technical Report RM-78. Ft. Collins, Colorado: Rocky Mountain Forest and Range Experiment Station.

Brown, M. 1960. Climates of the States: Nevada.

Bureau of Land Management. No date. Draft Environmental Statement, Intermountain Power Project.

Bureau of Land Management. 1977. Wyoming Land Use Decisions for the Overland Area. Rawlins District Office, Rawlins, Wyoming.

Bureau of Land Management. 1979a. Proposed Domestic Livestock Grazing Management Program for Caliente Area. Final Environmental Impact Statement. Las Vegas District Office.

Bureau of Land Management. 1979b. Visual Resources Management. Manual Series 8400.

Bureau of Land Management. 1980a. The California Desert Conservation Area. Final Environmental Impact Statement and Proposed Plan. Sacramento, California: California State Office.

Bureau of Land Management. 1980b. Utah BLM Intensive Wilderness Inventory, Wilderness Study Areas Map. Scale = 1:500,000.

Bureau of Land Management. 1981a. Wilderness Status Map, State of California. Scale = 1:1,000,000.

Bureau of Land Management. 1981b. Wilderness Status Map, State of Wyoming. Scale = 1:1,000,000.

Bureau of Land Management. 1982. Proposed Domestic Livestock Grazing Management Program for Clark County. Draft Environmental Impact Statement. Las Vegas, Nevada: Las Vegas District.

Bureau of Land Management. 1983a. Pinyon Management Framework Plan. June 10.

Bureau of Land Management. 1983b. Draft Toole Grazing Environmental Impact Statement. Salt Lake District Office, Salt Lake City, Utah.

Bureau of Land Management. 1983c. Proposed Grazing Management Program for the Salt Wells-Pilot Butte Area, Sweetwater and Uinta Counties, Wyoming. Rock Springs, Wyoming: Rock Springs District Office.

Bureau of Land Management. 1983d. Proposed Grazing Management Program of the Divide EIS Area, Draft Environmental Impact Statement. U.S. Department of the Interior, Bureau of Land Management, Rawlins District.

Bureau of Land Management. 1984a. Draft Resource Management Plan and Environmental Impact Statement for the Cedar/Beaver/Garfield/Antimony Planning Area. Cedar City District Office, Cedar City, Utah.

Bureau of Land Management. 1984b. Wilderness Status Map, State of Nevada. Scale = 1:1,000,000.

Bureau of Land Management. 1985. Kemmerer Resource Management Plan. Draft Environmental Impact Statement. Rock Springs, Wyoming: Rock Springs District Office. March 1985.

Bureau of Land Management. 1986a. Clark Mountain Resource Management Plan. California Desert District/Needles Resource Area. April.

Bureau of Land Management. 1986b. Draft Resource Management Plan and Environmental Impact Statement for the Warm Springs Resource Area. Richfield District Office, Richfield, Utah.

Bureau of Land Management. 1986c. Draft Resource Management Plan and Environmental Impact Statement for the House Range Resource Area. Richfield District Office, Richfield, Utah.

California Division of Mines and Geology. 1961. Los Angeles Sheet, Geologic Map.

California Division of Mines and Geology. 1961. Kingman Sheet, Geologic Map.

California Division of Mines and Geology. 1962. San Bernardino Sheet, Geologic Map.

California Division of Mines and Geology. 1962. Trona Sheet, Geologic Map.

Case, J.C. 1983. Geologic Hazards and Land-Use Planning, The Geologic Survey of Wyoming Public Information Circular No. 18. 18 pp.

Clark, L. (Chamber of Commerce, Baker, CA). 1986. Personal communication with C. Helseth. April 15.

Cole, E. (Lincoln County Clerk's Office, Pioche, NV). 1986. Personal communication with C. Helseth. April 14.

Cronquist, A., A.H. Holmgren, N.H. Holmgren, and J.L. Reveal. 1972. "Plant Geography of the Intermountain Region." In Intermountain Flora, Volume 1. pp. 77-161. New York: Hafner Publishing Company.

Donley, M.W., et al. 1979. Atlas of California.

Dorn, R.D. 1980. Illustrated Guide to Special Interest Vascular Plants of Wyoming. Report submitted to U.S. Fish and Wildlife Service and Bureau of Land Management.

Driver, Harold E. 1969. Indians of North America, 2nd edition, revised. Chicago: The University of Chicago Press.

Federal Energy Regulatory Commission, Office of Pipeline and Producer Regulation. 1980. Final Environmental Impact Statement - Trailblazer Pipeline System. FERC/EIS - 0018. September 1980.

Friends of the Pleistocene. 1985. Quaternary Lakes of the Eastern Mojave Desert, Field Trip Guide. 144 pp.

Frison, G.C. 1978. Prehistoric Hunters of the High Plains. New York: Academic Press.

Furtney, J. (State Planning Office, Research and Statistics, Cheyenne, WY). 1986. Personal communication with C. Helseth. Population estimates for 1985. April 10.

Gammon, J.R. 1970. The Effects of Inorganic Sediment on Stream Biota. Washington, D.C.: Water Quality Office of the Environmental Protection Agency. Grant #18050DWC.

Gochnour, N. (State Planning Office, Data Resources, Salt Lake City, UT). 1986. Personal communication with C. Helseth. Population estimates for July 1984. April 8.

Goode, H.D., R.A. Robinson, et al. 1965. Geology and Resources of South-central Utah. Guidebook to the Geology of Utah. Utah Geological and Mineralogical Survey. 177 pp.

Greer, D.C., et al. 1981. Atlas of Utah.

Hansen, C.L., J.R. Huning, and A.S. Endo. 1976. Soils Inventory: East Mojave Planning Unit. U.S. Department of the Interior, Bureau of Land Management, Riverside, California, and Department of Earth Sciences, University of California, Riverside.

Hansen, E. (Six-County Association of Governments, Richfield, UT). 1986. Personal communication with C. Helseth. April 15.

Hausel, W.D., and R.W. Jones. 1984. Self Guided Tour of the Geology of a Portion of Southeastern Wyoming. The Geological Survey of Wyoming, Public Information Circulation No. 21. 44 pp.

Heil, R.D., et al. 1977. Soils of Colorado. Bulletin 5663. Fort Collins, Colorado: Colorado State University Experiment Station. July.

Hull, F.W. and A. Avery. 1980. Cultural Resources Existing Data Inventory, Richfield District, Utah. University of Utah Archaeological Center, Reports of Investigation 80-19. Salt Lake City.

Hunt, C.B. 1967. Natural Regions of the United States and Canada. John Hopkins University. 725 pp.

Intermountain Association of Petroleum Geologists. 1959. Guidebook to the Geology of the Wasatch and Uinta Mountains. 235 pp.

James, S.R. and D.J. Singer. 1980. Cultural Resources Existing Data Inventory, Salt Lake District, Utah. University of Utah Archaeological Center, Reports of Investigation 80-17. Salt Lake City.

Kaliser, B.N. 1972. Geologic Hazards in Morgan County with Applications to Planning. Utah Geological and Mineralogical Survey. February.

Lizon, M. (State Department of Finance, Population Research, Sacramento, CA). 1986. Personal communication with C. Helseth. Population estimates for July 1, 1985. April 8.

Lowers, A.R. 1960. Climates of the States: Wyoming.

Mozingo, H.N. and M. Williams. 1980. Threatened and Endangered Plants of Nevada. An Illustrated Manual. Report submitted to U.S. Fish and Wildlife Service, Portland, Oregon, and U.S. Bureau of Land Management, Nevada State Office, Reno, Nevada.

Radbruch-Hall, D.H., R.B. Claton, et al. 1976. Preliminary Landslide Overview Map of the Continental U.S. USGS Map MF-771.

Raper, C. (Wyoming Game and Fish Department, Green River). Personal communication. April 17.

Rooke, L., L.N. Langan, and D.G. Bagley. 1968. Soil Survey: Pahranagat-Penoyer Areas, Nevada. U.S. Department of Agriculture Soil Conservation Service in cooperation with the University of Nevada Agricultural Experiment Station.

Root, F.K., et al. 1973. Geologic Map Atlas and Summary of Economic Mineral Resources, Geological Survey of Wyoming.

Rowlands, P., H. Johnson, E. Ritter, and A. Endo. 1982. "The Mojave Desert," in Reference Handbook on the Deserts of North America, edited by G.L. Bender, pp. 103-145. Westport, Connecticut: Greenwood Press.

Schroder, J.F. 1971. Landslides of Utah. Utah Geological and Mineralogical Survey Bull. 90. 51 pp.

Smith, J.P., Jr., and R. York. 1984. Inventory of Rare and Endangered Vascular Plants of California. California Native Plant Society Special Publication No. 1 (third edition).

Speck, R.L. 1985. Soil Survey of Las Vegas Valley Area, Nevada. Part of Clark County. U.S. Department of Agriculture Soil Conservation Service, in cooperation with U.S. Department of the Interior, Bureau of Land Management, and University of Nevada Agricultural Experiment Station.

Sorensen, J.H., N.J. Ericksen, and D.S. Mileti. 1975. Landslide Hazard in the United States. Institute of Behavioral Science, University of Colorado. 75 pp.

Stewart, B. (Wyoming Game and Fish Department). 1986. Personal communication. April 25.

Thompson, R.A., G.B. Thompson, and J. Embry. 1983. Class I Cultural Resource Inventory for the Cedar City District of the Bureau of Land Management. Part I - Cultural Resource Overview. Mesa CRM Paper No. 10. Salt Lake City.

Thume, H.W., et al. 1952. Guidebook to the Geology of Utah No. 7, Cedar City, Utah, to Las Vegas, Nevada. Intermountain Association of Petroleum Geologists. 165 pp.

Tyler, M. (Five-County Association of Governments, St. George, UT). 1986. Personal communication with C. Helseth. April 14.

U.S. Fish and Wildlife Service. 1978a. Stream Evaluation Map, State of Wyoming. Billings, Montana: U.S. Fish and Wildlife Service.

U.S. Fish and Wildlife Service. 1978b. Stream Evaluation Map, State of Utah. Salt Lake City, Utah: U.S. Fish and Wildlife Service.

U.S. Fish and Wildlife Service. 1985. "Endangered and Threatened Wildlife and Plants; Review of Plant Taxa for Listing as Endangered or Threatened Species; Notice of Review." Federal Register 50 (188).

U.S. Fish and Wildlife Service. 1986. "Endangered and Threatened Wildlife and Plants." 50 CFR 17.11 and 17.12. Washington, D.C.

U.S. Forest Service. 1974. Visual Management System. Agricultural Handbook 462.

U.S. Geological Survey. 1965. State of Nevada Base Map. Scale = 1:500,000.

U.S. Geological Survey. 1974. Land Use and Land Cover Map. San Bernardino, California. Scale = 1:250,000.

U.S. Geological Survey. 1975. Land Use and Land Cover Map. Los Angeles, California. Scale = 1:250,000.

U.S. Geological Survey. 1976a. Land Use and Land Cover Map. Kingman, Arizona; Nevada; California. Scale = 1:250,000.

U.S. Geological Survey. 1976b. Land Use and Land Cover Map. Trona, California. Scale = 1:250,000.

U.S. Geological Survey. 1977a. Land Use and Land Cover Map. Las Vegas, Nevada; Arizona; California. Scale = 1:250,000.

U.S. Geological Survey. 1977b. Land Use and Land Cover Map. Rawlins, Wyoming; Colorado. Scale = 1:250,000.

U.S. Geological Survey. 1977c. Land Use and Land Cover Map. Rock Springs, Wyoming; Colorado; Utah. Scale = 1:250,000.

U.S. Geological Survey. 1978a. Land Use and Land Cover Map. Cedar City, Utah; Arizona. Scale = 1:250,000.

U.S. Geological Survey. 1978b. Land Use and Land Cover Map. Delta, Utah. Scale = 1:250,000.

U.S. Geological Survey. 1978c. Land Use and Land Cover Map. Richfield, Utah. Scale = 1:250,000.

U.S. Geological Survey. 1979a. Land Use and Land Cover Map. Cheyenne, Wyoming; Nebraska; Colorado. Scale = 1:250,000.

U.S. Geological Survey. 1979b. State of Utah Base Map. Scale = 1:500,000.

U.S. Geological Survey. 1980. State of Wyoming Base Map. Scale = 1:500,000.

U.S. Geological Survey. 1981a. Land Use and Land Cover Map. Ogden, Utah; Wyoming. Scale = 1:250,000.

U.S. Geological Survey. 1981b. Land Use and Land Cover Map. Salt Lake City, Utah; Wyoming. Scale = 1:250,000.

U.S. Geological Survey. 1981c. State of California, Southern Half Base Map. Scale = 1:500,000.

Utah Division of Wildlife Resources (UDWR). 1983. Vertebrate Wildlife Species of Northern Utah. Ogden, Utah.

Walker, J. (Community Services, Carson City, NV). 1986. Personal communication with C. Helseth. Population estimates for July 1, 1985 by State of Nevada (1980 estimates for unincorporated towns). April 17.

Welsh, S.L. 1979. Illustrated Manual of Proposed Endangered and Threatened Plants of Utah. Report submitted to U.S. Fish and Wildlife Service, Denver, Colorado.

Wilson, George (Utah Division of Wildlife Resources). 1986. Personal communication. April 29.

Wilson, LeMoyne, et al. 1975. Soils of Utah. Bulletin 492. Logan, Utah: Utah State University Agricultural Experiment Station. March 1975.

Woodruff, G.A. 1980. Soil Survey of San Bernardino County. Southwestern Part, California. U.S. Department of Agriculture, Soil Conservation Service, in cooperation with University of California Agricultural Experiment Station.

Wyoming Game and Fish Department (WGFD). 1983. Lake and Stream Survey Reporting and Numbering System. Cheyenne, Wyoming.

Wyoming Geological Association. 1964. Highway Geology of Wyoming. 361 pp.

Wyoming Geological Association. 1980. Stratigraphy of Wyoming. 31st Annual Field Conference Guidebook. 318 pp.

Young, J.F., and P.C. Singleton. 1977. Wyoming General Soil Map. Research Journal 117. Laramie, Wyoming: University of Wyoming Agricultural Experiment Station. September 1977.

# APPENDIX A
# SOILS AND EROSION CONTROL MEASURES

APPENDIX A

SOILS AND EROSION CONTROL MEASURES

---

Site- and soil-specific mitigation measures would be developed for the route for submittal to and approval by the BLM and FS. Soils which are on steep slopes, are highly susceptible to erosion and would otherwise be reclamation/revegetation problems (i.e., areas of saline or alkaline soils) would receive particular attention. Specific reclamation plans would generally conform to the following specifications.

ALL SECTIONS

1. Work in saturated clayey soils would not occur until soils have dried adequately to allow equipment operation without excessive soil compaction and rutting.

2. BLM soil scientist contacts indicate that seeding often is not an effective means of vegetation re-establishment in areas with excessive saline-alkaline soil conditions or areas with less than 8 to 10 inches of average annual precipitation. It is anticipated that re-seeding generally would not be required in these areas. Differing requirements for individual districts will be stipulated in the Plan of Development.

3. Disturbed areas required to be re-seeded would be prepared by re-contouring and compaction of disturbed materials followed by surface roughening and/or tilling with the contour.

4. Where seeding would be effective in re-establishment of plant cover, seed would be broadcast and raked per surface management agency or landowner specifications. Disturbed areas would be seeded with a seed mixture of adapted grass or other plant species approved by the surface management agency and/or landowner.

PLOWED SECTIONS

1. Plowed sections are not expected to require reclamation unless grading is required to allow equipment movement. If desired by the surface management agency and/or landowner, a pass over the cable course will be made with a rubber-tired vehicle to compact the six to eight inch wide disturbed area. Where plowing would require dozing to allow equipment passage, the graded areas would be reclaimed as specified for "Trenched Sections."

2. Water bars, interception ditches, contour furrowing, trench blocks, rock mulch, matting (such as excelsior matting on slopes over 25 percent), sand bags, or straw bales would be selectively utilized to reduce "along-the-trench" erosion where potential soil erosion is high. These measures would normally be utilized where slopes exceed a 3:1 slope.

TRENCHED SECTIONS

1. Areas disturbed by trenching, soil storage and other activities would be recontoured to their original configuration.

2. Topsoil would be salvaged and replaced on agricultural lands, on lands where subsoil properties would substantially inhibit reclamation and on other lands where requested by the landowner.

3. Where reseeding would be effective in reclaiming disturbed areas, the soil surface would be prepared by surface roughening and/or tilling across slope. Soil amendments would be added where deemed necessary by the surface management agency and/or landowner.

4. Erosion control features would be constructed or placed to limit steepness and length of slope (e.g., water bars, collection ditches, terraces, rock mulch [riprap], or sand bags or straw bales for temporary control.

5. Areas would be seeded as described above and mulched with hay, straw or wood fibers. Mulching on steep slopes would be crimped or tacked with netting.

Additional and/or site-specific measures requested by either the BLM or FS will be added as stipulations to the operating agreements where appropriate.

Table A-1. CHARACTERISTICS OF THE SOILS IDENTIFIED ALONG THE RIGHT-OF-WAY (COLORADO AND WYOMING)

| Region/Land Type/Associations | Slope | Surface Texture | Erosion Hazard | | | Significant and Potentially Limiting Parameters |
|---|---|---|---|---|---|---|
| | | | Depth[a] | Water[b] | Wind[c] | |
| **COLORADO SEDIMENTARY UPLANDS** | | | | | | |
| Lithic Haplustolls - Aridic Arginstolls-Rock Outcrop[d] | Nearly level to steep | Loam | S-VD | L-M | M-H | Areas of neutral to mildly alkaline soils. |
| Aridic Argiustolls - Ustic Torriorthents | Gently sloping to steep | Loam | S-M | L-H | M-H | Areas of mild to moderately alkaline soils. |
| Ustollic Haplargids - Ustic Torriorthents | Gently sloping to steep | Clay loam, loam | S-VD | M-H | M | Areas of neutral to strongly alkaline soils. |
| **LARAMIE MOUNTAINS** | | | | | | |
| Argiborolls - Haploborolls | Rolling to steep | Coarse-medium | S-M | L-M | L | |
| **WYOMING BASIN** | | | | | | |
| Uplands | | | | | | |
| Torriorthents - Haplargids - Natrargids | Gently sloping to steep | Medium-coarse | S-VD | M | M-L | Areas of saline-alkaline soils |
| Torriorthents - Camborthids - Haplargids | Nearly level to steep | Medium | S-VD | M | L | |
| Torriorthents; shallow - Torriorthents | Undulating-hilly | Fine to medium | S-M | M-H | M-L | |
| Torriorthents - Camborthids | Gently sloping to steep | Medium | S-VD | H | M | |
| Calciorthids - Haplargids | Nearly level to rolling | Coarse to medium | VD | L | M | |
| Torriorthents, alkali | Level to undulating | Fine | VD | M | M | Areas of strong to very strongly alkaline soils |
| Alluvial | | | | | | |
| Torrifluvents - Fluvaquents - Halaquepts | Nearly level to gently sloping | Fine to coarse | VD | | | |
| **BEAR RIVER DIVIDE AND BASIN** | | | | | | |
| Uplands | | | | | | |
| Cryoborolls - Cryorthents | Rolling to steep | Fine to medium | S-VD | M | M-L | |
| Cryoborolls - Cryaquents | Nearly level to sloping | Medium | VD | L-M | M-L | |
| Calciorthids - Torriorthents | Nearly level to rolling | Medium | VD | M | L | |
| Alluvial | | | | | | |
| Calciorthids - Ustifluvents | Nearly level | Medium | VD | M | L | |
| **HIGH PLAINS OF EASTERN WYOMING** | | | | | | |
| Torriorthents - shallow | Rolling to steep | Medium to fine | S-M | M | M | |
| Arginstolls - Haplustolls - Torriorthents | Undulating to rolling | Medium to coarse | S-VD | M | M | |

[a]Soil depth classes: VS 0-10 inches; S 10-20 inches; MD 20-40 inches; D 40-60 inches; VD 60+ inches

[b]Based on WBG classes: H (high) = 1-2, M (moderate) = 3-4, and L (low) = 5-8 or SCS interpretations presented in soil mapping unit descriptions.

[c]Based on "K factor" values: L (low) <.2, M (moderate) = .2-.39, and H (high) ≥ .4 or SCS interpretations presented in soil mapping unit descriptions.

[d]Order of listing indicates relative composition of mapping unit.

Table A-2. CHARACTERISTICS OF THE SOILS IDENTIFIED ALONG THE RIGHT-OF-WAY (UTAH)

| Region/Land Type/Associations | Slope | Surface Texture | Erosion Hazard | | | Significant and Potentially Limiting Parameters | |
|---|---|---|---|---|---|---|---|
| | | | Depth[a] | Water[b] | Wind[c] | | |
| **UINTA/WASATCH MOUNTAINS** | | | | | | | |
| East Slope | | | | | | | |
| Xerollic Calciorthids - Xeric Torriorthents[d] | Level-rolling | Loams, silt loams, sandy and gravelly loams | D | M-L | NA | Areas of strongly alkaline soils | |
| Aridic Calcixerolls - Xerollic Calciorthids | Gentle-steep | Loams, gravelly & cobbly loams, sandy loams | D-MD | M-L | L | Moderate - strong | |
| West Slope | | | | | | | |
| Typic Argixerolls - Typic Haploxerolls | Sloping-very steep | Loams, stony & cobbly loams & silt loams | D-MD | M | L | None - mild | Rock outcrops |
| Lithic Haploxerolls - Typic Haploxerolls | Sloping-very steep | Cobbly & gravelly sand, silt & clay loams | S-D | M | L | None - mild | Rock outcrops |
| Pachic Argixerolls - Typic Argixerolls - Calcic Argixerolls | Steep-very steep | Loams, silt loams & cobbly sandy clay loams | D-MD | L | L | Mild to moderate | |
| **SALT LAKE/JORDAN RIVER PLAIN** | | | | | | | |
| Calcic Argixerolls - Calcic Haploxerolls | Smooth to gently sloping | Loams, silt loams, fine sandy loams, silty clay loams | D-MD | M-L | L | None - strong | |
| Typic Calcixerolls - Calcic Argixerolls | Smooth to gently sloping | Silt & fine sandy loams, gravelly & cobbly loams | D | M-L | M-L | None - strong | |
| Aquic Calciustolls - Typic Calciaquolls - Fluvaquentic Haplustolls | Smooth, nearly level | Loams, silty clay loams & silty clays | D | L | M-L | Mild - strong | |
| Playas | Level | Clayey | D | ? | ? | | Salt accumulations |
| **WESTERN UTAH DESERT** | | | | | | | |
| Alluvial Fans, Terraces, and Dry Valleys | | | | | | | |
| Aridic Calcixerolls - Xerollic Calciorthids | Gentle-rolling | Loams, gravelly & cobbly loams | D | M-L | M | Moderate - strong | |
| Xerix Torrifluvents - Xerollic Calciorthids | Smooth-undulating | Silt loams, loams & find sandy loams | D | M-L | M | Mild - strong | |
| Xerollic Calciorthids - Xeric Torrifluvents | Undulating-rolling | Loams, sandy loams & gravelly sandy loams | D | M-L | L | Mild - strong | |
| Typic Torrifluvents - Typic Torriorthents | Smooth-gently undulating | Loams, silt loams, silty clay loams, fine sands, sandy loams | D | M | M-H | Mild - strong | |
| Typic Calciorthids - Typic Torriorthents | Gently rolling | Sandy loams, find sands, silt loams, sandy clay loams | D | L-M | M-L | Moderate - strong | |
| Typic Torripsamments - Typic Torriorthents | Undulating-rolling | Fine sands | D | M-L | H | Mild - strong | |

Table A-2. CHARACTERISTICS OF THE SOILS IDENTIFIED ALONG THE RIGHT-OF-WAY (UTAH) (concluded)

| Region/Land Type/Associations | Slope | Surface Texture | Erosion Hazard | | | Significant and Potentially Limiting Parameters |
|---|---|---|---|---|---|---|
| | | | Depth[a] | Water[b] | Wind[c] | |
| WESTERN UTAH DESERT (concluded) | | | | | | |
| Desert Mountains | | | | | | |
| Lithic Xerollic Calciorthids - Xerollic Calciorthids | Steep-very steep | Stony & gravelly loams, loams & sandy loams | S-D | M | L | Mild - strong |
| Valley Bottoms and Floodplains | | | | | | |
| Typic Natrargids - Xerollic Natrargids - Typic Calciorthids | Smooth-gently undulating | Loams, silt loams & silty clay loams | D | M | M | Moderate - very strong |
| Aquic Xerofluvents - Aquic Ustifluvents - Typic Torrifluvents | Smooth-gently undulating<br>steep | Loams, fine sandy loams, silty clay loams & clays | D | H | M | Mild - strong |

[a]Soil depth classes: VS 0-10 inches MD 20-40 inches VD 60+ inches
S 10-20 inches D 40-60 inches

[b]Based on WEG classes: H (high) = 1-2, M (moderate) = 3-4, and L (low) = 5-8 or SCS interpretations presented in soil mapping unit descriptions.

[c]Based on "K factor" values: L (low) <.2, M (moderate) = .2-.39, and H (high) ≥ .4 or SCS interpretations presented in soil mapping unit descriptions.

[d]Order of listing indicates relative composition of mapping unit.

Table A-3. CHARACTERISTICS OF THE SOILS IDENTIFIED ALONG THE RIGHT-OF-WAY (NEVADA)

| Region/Land Type/Associations | Slope | Surface Texture | Erosion Hazard | | | Significant and Potentially Limiting Parameters |
|---|---|---|---|---|---|---|
| | | | Depth[a] | Water[b] | Wind[c] | |
| **MEADOW VALLEY AREA** | | | | | | |
| Upper Terraces and Alluvial Fans | | | | | | |
| Xerollic Durargids - Aridic Durixerolls[d] | Gently sloping-moderately steep | Gravelly clay loams and loams | MD-VD | M | L | |
| Aridic Durixerolls - Aridic Argixerolls | Nearly level-moderately steep | Gravelly loams and sandy loams | S-MD | M | L | |
| Xeric Torriorthents - Xerollic Paleorthids | Nearly level-moderately steep | Gravelly loams and sandy loams | S-MD | M | L | |
| Haploxerollic Durargids - Aridic Durixerolls | Nearly level-sloping | Stony or gravelly loams and sandy loams | S | M | L | |
| Low Mountains and Foothills | | | | | | |
| Lithic Argixerolls - Rock outcrop - Lithic Haploxerolls | Gently sloping-steep | Stony and cobbly loams | VS-MD | L-H | L | |
| Floodplains, Low Terraces, and Alluvial Fans | | | | | | |
| Typic Torriorthents - Xeric Torriorthents - Durixerollic Camborthids | Nearly level-moderately sloping | Silt loams, sandy loams, gravelly sandy loams, loams | VD | L-M | L-M | Areas of saline-affected soils |
| **DELAMAR MOUNTAINS AND VALLEY AREA** | | | | | | |
| Upper Terraces and Alluvial Fans | | | | | | |
| Durorthids-Durargids-Haplargids-Torriorthents | Nearly level to sloping | Coarse sandy and gravelly loams | S-MD | L-M | L-M | |
| Typic Torripsamments-Andic Torripsamments | Nearly level to moderately steep | Stony, cobbly, or gravelly loamy sands and sandy loams | D-VD | M | M | |
| Durorthids-Paleorthids | Nearly level to sloping | - - - | S-MD | L | L | |
| Mountains, Foothills, and Ridges | | | | | | |
| Andic Lithic Torriorthents-Lithic Torriorthents | Sloping to very steep | Stony, cobbly, or gravelly sandy loams and loams | VS-S | M-H | M | |
| Argixcrolls-Haplargids | Sloping to very steep | Stony, cobbly, or gravelly loams to clay loams | S-MD | M | L | |
| Haplargids-Torriorthents-Rock outcrop | Sloping to very steep | Bouldery, strong sandy loams, loams, and clay loams | VS-S | M-H | L-M | |
| Floodplains, Low Terraces, and Alluvial Fans | | | | | | |
| Torriorthents-Haplargids-Camborthids | Level to gently sloping | - - - | MD-VD | L-M | M-H | |
| Typic Torrifluvents-Typic Torriorthents | Nearly level | Sandy and silt loams | VD | L | M | |
| Playas and adjoining floodplains | | Silty clay materials | | | | |
| **COYOTE SPRING VALLEY AND ARROW CANYON RANGE AREA** | | | | | | |
| Dissected Terraces, Breaks, Low Hills, and Alluvial Fans | | | | | | |
| Typic Paleorthids - Petrocalcic Paleargids - Typic Calciorthids | Nearly level-moderately steep | Gravelly sand and clay loams | MD-D | L-M | L-M | |
| Torriorthents-Camborthids | Nearly level-steep | - - - | MD-D | L-H | L-M | |
| Mountains and Foothills | | | | | | |
| Rockland - Lithic Torriorthents | Moderately steep-very steep | Cobbly loams | S | M | L | |
| Floodplains, Low Terraces, and Alluvial Fans | | | | | | |
| Typic Torrifluvents - Typic Torripsamments | Nearly level-sloping | Loams and fine sands | D | L-H | L-H | Areas of saline-affected soils |
| Torriorthents-Torrifluvents | Level to sloping | - - - | MD-VD | L-M | L-H | |

Table A-3. CHARACTERISTICS OF THE SOILS IDENTIFIED ALONG THE RIGHT-OF-WAY (NEVADA) (concluded)

| Region/Land Type/Associations | Slope | Surface Texture | Erosion Hazard | | | Significant and Potentially Limiting Parameters |
|---|---|---|---|---|---|---|
| | | | Depth[a] | Water[b] | Wind[c] | |
| LAS VEGAS VALLEY AREA | | | | | | |
| Alluvial Fans and Alluvial Remnants and Sand Sheets | | | | | | |
| Typic Paleorthids | Nearly level-moderately steep | Extremely stony or gravelly loams and loams | VS-S | L | M-H | Shallow over indurated, lime-cemented hardpan |
| Typic Torripsamments - Typic Calciorthids | Nearly level-moderately steep | Gravelly loamy fine sand | VD | L | H | Desert pavement covers soils |
| Typic Calciorthids - Typic Torriorthents | Nearly level-sloping | Very gravelly or cobbly fine sandy loams | VD | L | M | Desert pavement covers soils |
| Typic Calciorthids - Cambic Gypsiorthids | Gently sloping-moderately steep | Very cobbly or gravelly loamy sands or sandy loam | VD | L | M-H | Desert pavement covers most soils |

[a]Soil depth classes: VS 0-10 inches MD 20-40 inches VD 60+ inches
S 10-20 inches D 40-60 inches

[b]Based on WBG classes: H (high) = 1-2, M (moderate) = 3-4, and L (low) = 5-8 or SCS interpretations presented in soil mapping unit descriptions.

[c]Based on "K factor" values: L (low) <.2, M (moderate) = .2-.39, and H (high) ≥ .4 or SCS interpretations presented in soil mapping unit descriptions.

[d]Order of listing indicates relative composition of mapping unit.

Table A-4. CHARACTERISTICS OF THE SOILS IDENTIFIED ALONG THE RIGHT-OF-WAY (CALIFORNIA)

| Region/Land Type/Associations | Slope | Surface Texture | Erosion Hazard | | | Significant and Potentially Limiting Parameters |
|---|---|---|---|---|---|---|
| | | | Depth[a] | Water[b] | Wind[c] | |
| **MOJAVE DESERT AREA** | | | | | | |
| Alluvial Floodplains, Terraces, Fans, and Basin Rims | | | | | | |
| Typic Torriorthents[d] | Nearly level-gently sloping | Loamy Coarse sands, gravelly sandy loams, sandy loams | MD-D | L-M | M-H | Desert pavement of gravels and cobbles covers soils (60-100%) |
| Typic Torripsamments | Nearly level | Loamy sands, gravelly loamy sands | MD-D | L | M-H | Desert pavement of gravels covers soils (50-90%) |
| Typic Calciorthids | Nearly level-gently sloping | Loamy fine sands and sandy loams | S-MD | M | M-H | |
| Typic Haplargids | Nearly level-sloping | Loamy sands to silt loams | D-VD | L-M | L-H | Surface soil textures are highly variable, cobbles and stones may cover 50-90% of surface |
| Typic Torrifluvents | Nearly level - sloping | Cobbly sands to loams | D-VD | M-H | M-H | Areas of saline-affected soils, surface soil textures are highly variable |
| Typic Natriargids | Nearly level - sloping | Sand to sandy loam | VD | L | H | Areas of alkaline and saline soils |
| Old Terraces, Alluvial Fans, Foothills, and Mountains | | | | | | |
| Typic Haplargids - Haplic Durargids | Nearly level - moderately steep | Sandy loams and loams | MD-VD | M-H | L | Desert pavement of gravels and cobbles covers soil (70-90%) |
| Typic Durargids | Nearly level-sloping | Sandy loams | S-MD | M | L | Desert pavement of gravels and cobbles covers soil (40-60%) |
| Typic Torriorthents | Sloping-very steep | Cobbly or gravelly sandy loams | VD | M | L | Surface covered with 30-50% cobbles in some areas |
| Rock Outcrop - Lithic Torriorthents | Moderately steep-very steep | Very gravelly sands to sandy loams | VS-S | H | M-H | Soils cover about 30% of map unit |
| **SAN BERNARDINO MOUNTAINS AREA** | | | | | | |
| Mountains, Foothills, Alluvial Fans, and Terraces | | | | | | |
| Xeric Xerochrepts - Rock Outcrop - Entic Haploxerolls | Steep-very steep | Sandy loams | MD | M | M | |
| Gullied Land - Haploxeralfs - Mollic Haploxeralfs | Nearly level-steep | Sandy loams | VD | M-H | L-M | |
| Mollic Xerofluvents - Pachic Haploxerolls | Gently sloping-sloping | Sandy loams | VD | M | M | |
| Xeric Torriorthents - Xeralfic Haplargids | Gently sloping-sloping | Loamy fine sands to sandy loams | VD | L-M | M-H | |
| Typic Xerorthents - Entic Haploxerolls - Lithic Haploxerolls | Sloping-very steep | Sandy loams | S | M-H | M-H | |
| **LOS ANGELES-SAN BERNARDINO AREA** | | | | | | |
| Alluvial Valley Floors, Fans, and Terraces | | | | | | |
| Typic Xerorthents -Typic Haploxeralfs - Typic Xerofluvents | Nearly level-moderately steep | Sandy loams | VD | L-H | | Erosion hazard increases with increasing slopes |
| Typic Xeropsamments - Typic Xerorthents | Moderately level-sloping | Stoney, gravelly loamy sands and loamy sands | D | L | M-H | |

[a]Soil depth classes: VS 0-10 inches; S 10-20 inches; MD 20-40 inches; D 40-60 inches; VD 60+ inches

[b]Based on WBG classes: H (high) = 1-2, M (moderate) = 3-4, and L (low) = 5-8 or SCS interpretations presented in soil mapping unit descriptions.

[c]Based on "K factor" values: L (low) <.2, M (moderate) = .2-.39, and H (high) ≥ .4 or SCS interpretations presented in soil mapping unit descriptions.

[d]Order of listing indicates relative composition of mapping unit.

# APPENDIX B

# VISUAL RESOURCE MANAGEMENT CLASSIFICATIONS

Table B-1. VISUAL RESOURCE MANAGEMENT CLASSIFICATIONS

| Location of Regenerator Stations and Transmission Lines | Map Sheet Number (Appendix E) | Ownership | VRM Classification |
|---|---|---|---|
| PROPOSED ACTION | | | |
| Weld County, Colorado<br>T12N R67W Sec. 20<br>MP 0 | 1 | Private | N/A |
| Laramie County, Wyoming<br>T13N R70W Sec. 15<br>MP 15.8 | 3 | Private | N/A |
| Albany County, Wyoming<br>T15N R73W Sec. 29<br>MP 41.2 | 3 | Private | N/A |
| Albany County, Wyoming<br>T17N R76W Sec. 20<br>MP 64.2 | 3 | Private | N/A |
| Carbon County, Wyoming<br>T19N R78W Sec. 19<br>MP 82.9 | 5 | Private | N/A |
| Carbon County, Wyoming<br>T21N R83W Sec. 14<br>MP 114.2 | 5 | Private | N/A |
| Carbon County, Wyoming<br>T21N R85W Sec. 35<br>MP 128.0 | 5 | Private | N/A |
| Carbon County, Wyoming<br>T21N R90W Sec. 34<br>MP 159.2 | 6 | BLM | III |
| Sweetwater County, Wyoming<br>T20N R94W Sec. 27<br>MP 182.0 | 6 | Private | N/A |
| Sweetwater County, Wyoming<br>T19N R96W Sec. 8<br>MP 196.2 | 7 | Private | N/A |
| Sweetwater County, Wyoming<br>T20N R101W Sec. 28<br>MP 225.2 | 7 | BLM | III |

Table B-1. VISUAL RESOURCE MANAGEMENT CLASSIFICATIONS (continued)

| Location of Regenerator Stations and Transmission Location | Map Sheet Number (Appendix E) | Ownership | VRM Classification |
|---|---|---|---|
| Sweetwater County, Wyoming<br>T18N R105W Sec. 6<br>MP 254.2 | 8 | Private | N/A |
| Sweetwater County, Wyoming<br>T18N R110W Sec. 14<br>MP 281.7 | 8 | BLM | III |
| Unita County, Wyoming<br>T18N R113W Sec. 35<br>MP 300.7 | 9 | Private | N/A |
| Unita County, Wyoming<br>T16N R116W Sec. 35<br>MP 321.2 | 10 | BLM | III |
| Unita County, Wyoming<br>T15N R120W Sec. 28<br>MP 347.7 | 10 | Private | N/A |
| Morgan County, Wyoming<br>T5N R5E Sec. 10<br>MP 16.6 | 11 | Private | N/A |
| Morgan County, Utah<br>T14N R4E Sec. 20<br>MP 28.6 | 11 | Private | N/A |
| Morgan County, Utah<br>T5N R1E Sec. 27<br>MP 48.6 | 11 | Private | N/A |
| Salt Lake County, Utah<br>T2N R1W Sec. 1<br>MP 71.4 | 12 | Private | N/A |
| Salt Lake County, Utah<br>T1S R2W Sec. 1<br>MP 80.9 | 14 | Private | N/A |
| Utah County, Utah<br>T4S R1W Sec. 22<br>MP 103.8 | 15 | Private | N/A |

Table B-1. VISUAL RESOURCE MANAGEMENT CLASSIFICATIONS (continued)

| Location of Regenerator Stations and Transmission Location | Map Sheet Number (Appendix E) | Ownership | VRM Classification |
|---|---|---|---|
| Utah County, Utah<br>T7S R3W Sec. 1<br>MP 126.8 | 15 | Private | N/A |
| Tooele County, Utah<br>T10S R3W Sec. 27<br>MP 155.8 | 17 | Bankhead-Jones | N/A |
| Juab County, Utah<br>T14S R4W Sec. 30<br>MP 183.9 | 17 | Private | N/A |
| Millard County, Utah<br>T16N R6W Sec. 34<br>MP 199.8 | 18 | Private | N/A |
| Millard County, Utah<br>T19S R8W Sec. 23<br>MP 221.2 | 18 | BLM | IV |
| Millard County, Utah<br>T23S R9W Sec. 16<br>MP 245.8 | 19 | State | N/A |
| Beaver County, Utah<br>T27S R10W Sec. 32<br>MP 289.1 | 21 | Private | N/A |
| Iron County, Utah<br>T32S R14W Sec. 11<br>MP 312.6 | 21 | Private | N/A |
| Iron County, Utah<br>T33S R16W Sec. 33<br>MP 330.3 | 22 | BLM | IV |
| Iron County, Utah<br>T34S R19W Sec. 36<br>MP 349.2 | 22 | Private | N/A |
| Lincoln County, Nevada<br>T2S R68E Sec. 9<br>MP 18.9 | 23 | BLM | III |

Table B-1. VISUAL RESOURCE MANAGEMENT CLASSIFICATIONS (continued)

| Location of Regenerator Stations and Transmission Location | Map Sheet Number (Appendix E) | Ownership | VRM Classification |
|---|---|---|---|
| Lincoln County, Nevada<br>T2S R65E Sec. 29<br>MP 41.0 | 23 | Private | N/A |
| Lincoln County, Nevada<br>T6S R63E Sec. 12<br>MP 62.6 | 25 | BLM | IV |
| Lincoln County, Nevada<br>T10S R62E Sec. 13<br>MP 89.6 | 25 | BLM | IV |
| Clark County, Nevada<br>T14S R63E Sec. 33<br>MP 119.1 | 27 | BLM | IV |
| Clark County, Nevada<br>T18S R63E Sec. 10<br>MP 138.0 | 28 | BLM | III |
| Clark County, Nevada<br>T20S R62E Sec. 22<br>MP 157.7 | 29 | Private | N/A |
| Clark County, Nevada<br>T23S R61E Sec. 9<br>MP 178.4 | 30 | BLM | IV |
| San Bernardino County, California<br>T17N R15E Sec. 7<br>MP 0.2 | 30 | BLM | III |
| San Bernardino County, California<br>T16N R10E Sec. 4<br>MP 29.4 | 30 | BLM | IV |
| San Bernardino County, California<br>T15N R8E Sec. 20<br>MP 45.9 | 32 | BLM | IV |

Table B-1. VISUAL RESOURCE MANAGEMENT CLASSIFICATIONS (continued)

| Location of Regenerator Stations and Transmission Location | Map Sheet Number (Appendix E) | Ownership | VRM Classification |
|---|---|---|---|
| San Bernardino County, California<br>T11N R4E Sec. 10<br>MP 76.8 | 32 | BLM | IV |
| San Bernardino County, California<br>T9N R1E Sec. 26<br>MP 99.1 | 33 | BLM | III |
| San Bernardino County, California<br>T6N R3W Sec. 21<br>MP 126.1 | 34 | Private | N/A |
| San Bernardino County, California<br>T3N R5W Sec. 8<br>MP 154.4 | 35 | Private | N/A |
| San Bernardino County, California<br>T1N R6W Sec. 22<br>MP 177.8 | 35 | Private | N/A |
| Los Angeles County, California<br>T1S R10W Sec. 12<br>MP 202.8 | 35 | Private | N/A |
| Los Angeles County, California<br>T1S R12W Sec. 30<br>MP 219.3 | 36 | Private | N/A |
| MOUNTAIN BELL ALTERNATIVE | | | |
| Laramie County, Wyoming<br>T12N R67W Sec. 20<br>MP 0.5 | 1 | State | N/A |
| Laramie County, Wyoming<br>T13N R69W Sec. 10<br>MP 22.4 | 3 | Private | N/A |

Table B-1. VISUAL RESOURCE MANAGEMENT CLASSIFICATIONS (continued)

| Location of Regenerator Stations and Transmission Location | Map Sheet Number (Appendix E) | Ownership | VRM Classification |
|---|---|---|---|
| Albany County, Wyoming<br>T14N R71W Sec. 31<br>MP 37.4 | 3 | Private | N/A |
| Albany County, Wyoming<br>T16N R73W Sec. 8<br>MP 57.8 | 3 | Private | N/A |
| Albany County, Wyoming<br>T18N R75W Sec. 25<br>MP 69.6 | 3 | Private | N/A |
| Albany County, Wyoming<br>T19N R77W Sec. 4<br>MP 88.5 | 5 | State | N/A |
| Carbon County, Wyoming<br>T20N R80W Sec. 21<br>MP 106.7 | 5 | Private | N/A |
| Carbon County, Wyoming<br>T20N R83W Sec. 23<br>MP 122.6 | 5 | Private | N/A |
| Carbon County, Wyoming<br>T21N R86W Sec. 21<br>MP 145.0 | 6 | Private | N/A |
| Sweetwater County, Wyoming<br>T21N R90W Sec. 33<br>MP 169.3 | 6 | Private | N/A |
| Sweetwater County, Wyoming<br>T19N R95W Sec. 4<br>MP 200.1 | 7 | BLM | III |
| Sweetwater County, Wyoming<br>T19N R100W Sec. 5<br>MP 230.1 | 7 | Private | N/A |
| Sweetwater County, Wyoming<br>T19N R104W Sec. 29<br>MP 259.5 | 8 | Private | N/A |

Table B-1. VISUAL RESOURCE MANAGEMENT CLASSIFICATIONS (concluded)

| Location of Regenerator Stations and Transmission Location | Map Sheet Number (Appendix E) | Ownership | VRM Classification |
|---|---|---|---|
| Sweetwater County, Wyoming<br>T18N R107W Sec. 22<br>MP 278.4 | 8 | Private | N/A |
| Sweetwater County, Wyoming<br>T18N R110W Sec. 15<br>MP 296.8 | 8 | Private | N/A |
| Uinta County, Wyoming<br>T16N R114W Sec. 4<br>MP 324.6 | 10 | Private | N/A |
| Uinta County, Wyoming<br>T15N R117W Sec. 19<br>MP 348.3 | 10 | Private | N/A |
| Uinta County, Wyoming<br>T15N R120W Sec. 29<br>MP 366.1 | 10 | Private | II |

1 N/A (Not/Applicable) is indicated for all non-federal repeater locations where color requirements and VRM classifications are unnecessary.

# APPENDIX C

## WETLANDS CROSSED BY TH RIGHT-OF-WAY

Table C-1. WETLANDS CROSSED BY THE RIGHT-OF-WAY

| State | County | Township, Range, Section | Length (miles) | Notes* |
|---|---|---|---|---|
| Wyoming | Albany | T15N, R74W, Sec. 12-13 | 0.8 | Laramie River, irrigated hay and pasture |
| Wyoming | Albany | T15N, R75W, Sec. 5<br>T16N, R75W, Sec. 31-32 | 2 | Little Laramie River, irrigated hay and pasture |
| Wyoming | Albany | T17N, R77W, Sec. 12 | 0.7 | Sevenmile Creek, irrigated hay and pasture |
| Wyoming | Albany | T17N, R77W, Sec. 2-3 | 0.3 | Fourmile Creek, irrigated hay and pasture |
| Wyoming | Albany | T18N, R77W, Sec. 20 & 28,29 | 0.9 | Cooper Creek, irrigated hay and pasture |
| Wyoming | Carbon | T18N, R78W, Sec. 11-12 | 0.7 | Dutton Creek, irrigated hay and pasture |
| Wyoming | Carbon | T19N, R78W, Sec. 19 | 0.3 | Rock Creek, wooded riparian area |
| Wyoming | Carbon | T20N, R80W, Sec. 15 | 0.7 | Medicine Bow River, irrigated hay and pasture and wooded riparian area |
| Wyoming | Uinta | T15N, R120W, Sec. 27 | 1.0 | Bear River, irrigated agriculture |
| Wyoming | Uinta | T15N, R121W, Sec. 25 | 0.4 | Yellow Creek, irrigated agriculture |
| Utah | Morgan | T5N, R4E, Sec. 24, 25, 26, 34, 35<br>T4N, R4E, Sec. 3, 4, 9, 17, 20 | 8.0 | Lost Creek, irrigated agriculture |
| Utah | Morgan | T4N, R3E, Sec. 31<br>T4N, R2E, Sec. 5, 6, 8, 16, 21, 22, 25, 26, 27, 36<br>T5N, R2E, Sec. 31 | 9.0 | Weber River, irrigated agriculture |

Table C-1. WETLANDS CROSSED BY THE RIGHT-OF-WAY (concluded)

| State | County | Township, Range, Section | Length (miles) | Notes* |
|---|---|---|---|---|
| Utah | Davis | T3N, R1W, Sec. 36<br>T2N, R1W,<br>Sec. 1, 12, 33, 34 | 2.5 | Great Salt Lake margin |
| Utah | Davis/<br>Salt Lake | T1N, R1W, Sec. 4 | 1.0 | Great Salt Lake margin |
| Utah | Salt Lake | T1N, R1W, Sec. 8, 9,<br>17, 19, 20, 30 | 3.5 | Great Salt Lake margin |
| Utah | Salt Lake | T1N, R2W, Sec. 25, 36<br>T1S, R2W, Sec. 1, 11,<br>12, 14, 23, 26 | 7.0 | Great Salt Lake margin |
| Utah | Millard | T16S, R6W, Sec. 27 | 0.5 | Sevier River |
| Utah | Millard | T19S, R8W, Sec. 1, 12,<br>13, 14 | 2.0 | Dry Lake |
| Nevada | Clark | T16S, R63E, Sec. 9,<br>16, 20, 21, 29, 32 | 5.0 | Dry Lake<br>(Hidden Valley) |
| Nevada | Lincoln | T7S, R63E, Sec. 21,18 | 1.0 | Delamar Lake<br>(Dry Lake) |

*The areas of irrigated agriculture designated are those consisting mostly of irrigated native hay or pasture, on floodplains of creeks, where wet meadows or other wetland types may occur.

# APPENDIX D

## RIVERS, CREEKS, AND DRAINAGES CROSSED BY THE PROJECT RIGHT-OF-WAY

Table D-1. RIVERS, CREEKS, AND DRAINAGES CROSSED BY THE PROJECT RIGHT-OF-WAY

| Name | County | Township | Range | Section | Milepost | Approx. Width | Type[a] |
|---|---|---|---|---|---|---|---|
| WYOMING | | | | | | | |
| Brush Creek | Laramie | T12N | R68W | 15 | | | I |
| Brush Creek | Laramie | T12N | R68W | 9 | | | I |
| Duck Creek | Laramie | T12N | R68W | 8 | | | I |
| Unnamed | Laramie | T12N | R69W | 1 | | | I |
| Goose Creek | Laramie | T13N | R69W | 34 | | | I |
| Willow Creek (S. Fk) | Laramie | T13N | R69W | 28 | | | I |
| Willow Creek (M. Fk) | Laramie | T13N | R69W | 29 | | | I |
| Willow Creek (N. Fk) | Laramie | T13N | R69W | 19 | | | I |
| Lone Tree Creek | Laramie | T13N | R70W | 24 | 15 | 2-15 | P |
| Lone Tree Creek | Albany | T13N | R71W | 12 | | | P |
| Lone Tree Creek | Albany | T13N | R71W | 11 | | | P |
| Lone Tree Creek | Albany | T13N | R71W | 3 | | | P |
| Dale Creek (E. Fk) | Albany | T14N | R72W | 25 | | | I |
| Dale Creek (W. Fk) | Albany | T14N | R72W | 25 | | | P |
| Spring Creek | Albany | T14N | R73W | 25 | | | I |
| Unnamed | Albany | T14N | R73W | 23 | | | I |
| Unnamed | Albany | T14N | R73W | 14 | | | I |
| Unnamed | Albany | T14N | R73W | 15 | | | I |
| Unnamed | Albany | T14N | R73W | 10 | | | I |
| Simpsons Springs Creek | Albany | T15N | R73W | 36 | | | I |
| Unnamed | Albany | T15N | R73W | 23 | | | I |
| Five Mile Creek | Albany | T15N | R74W | 13 | | | I |
| Laramie River | Albany | T15N | R74W | 13 | 44 | 10-20 | P |
| Pioneer Canal | Albany | T15N | R74W | 11 | | | I |
| North Canal | Albany | T15N | R74W | 2 | | | I |
| Unnamed | Albany | T16N | R74W | 29 | | | I |
| Flat Ditch | Albany | T16N | R75W | 14 | | | I |
| Poverty Ditch | Albany | T16N | R75W | 14 | | | I |
| Park Ditch | Albany | T16N | R75W | 4 | | | I |
| Unnamed Ditch | Albany | T16N | R75W | 4 | | | I |

Table D-1. RIVERS, CREEKS, AND DRAINAGES CROSSED BY THE PROJECT RIGHT-OF-WAY (continued)

| Name | County | Township | Range | Section | Milepost | Approx. Width | Type[a] |
|---|---|---|---|---|---|---|---|
| WYOMING (cont'd) | | | | | | | |
| Sand Creek | Albany | T16N | R75W | 5 | | | I |
| Browns Creek | Albany | T16N | R75W | 5 | 58 | 2-10 | P |
| Unnamed | Albany | T17N | R75W | 32 | | | I |
| Alsop Slough | Albany | T17N | R75W | 32 | | | I |
| Little Laramie River | Albany | T17N | R75W | 32 | 59 | 10-20 | P |
| Unnamed Ditch | Albany | T17N | R75W | 31 | | | I |
| Unnamed Ditch | Albany | T17N | R75W | 31 | | | I |
| Unnamed Ditch | Albany | T17N | R75W | 31 | | | I |
| Snake Ditch | Albany | T17N | R76W | 25 | | | I |
| Unnamed | Albany | T17N | R76W | 25 | | | I |
| Unnamed | Albany | T17N | R76W | 22 | | | I |
| Unnamed | Albany | T17N | R76W | 21 | | | I |
| Unnamed | Albany | T17N | R76W | 17 | | | I |
| Unnamed | Albany | T17N | R76W | 18 | | | I |
| Seven Mile Creek | Albany | T17N | R77W | 12 | 67 | 2-5 | I |
| Unnamed | Albany | T17N | R77W | 2 | | | I |
| One Mile Ditch | Albany | T17N | R77W | 2 | | | P |
| Four Mile Creek | Albany | T17N | R77W | 2 | | | P |
| Cooper Creek (S. Fk) | Albany | T18N | R77W | 28 | | | I |
| Cooper Creek | Albany | T18N | R77W | 29 | | | P |
| Cooper Creek | Albany | T18N | R77W | 19 | | | P |
| Unnamed | Carbon | T18N | R77W | 18 | | | I |
| Sheep Creek | Carbon | T18N | R77W | 18 | | | I |
| Sheep Creek | Carbon | T18N | R77W | 18 | | | I |
| Dutton Creek (E. Fk) | Carbon | T18N | R78W | 11 | | | P |
| Dutton Creek (W. Fk) | Carbon | T18N | R78W | 11 | | | P |
| Jimmie Creek | Carbon | T18N | R78W | 3 | | | P |
| Seepage Creek | Carbon | T18N | R78W | 3 | | | P |
| Three Mile Creek | Carbon | T19N | R78W | 33 | | | P |
| Canon Ditch | Carbon | T19N | R78W | 29 | | | I |

Table D-1. RIVERS, CREEKS, AND DRAINAGES CROSSED BY THE PROJECT RIGHT-OF-WAY (continued)

| Name | County | Township | Range | Section | Milepost | Approx. Width | Type[a] |
|---|---|---|---|---|---|---|---|
| WYOMING (cont'd) | | | | | | | |
| One Mile Creek | Carbon | T19N | R78W | 30 | | | P |
| Rock Creek | Carbon | T19N | R78W | 19 | 83 | Braided/1 mi. | P |
| Foote Creek (E. Fk) | Carbon | T19N | R79W | 13 | | | I |
| Foote Creek (W. Fk) | Carbon | T19N | R79W | 13 | | | I |
| Unnamed | Carbon | T19N | R79W | 3 | | | I |
| Wagonhound Creek | Carbon | T20N | R79W | 31 | 90 | 2-5 | P |
| Medicine Bow River | Carbon | T20N | R80W | 16 | 96 | 5-15 | P |
| Unnamed | Carbon | T20N | R80W | 6 | | | I |
| Unnamed | Carbon | T21N | R81W | 22 | | | I |
| Unnamed | Carbon | T21N | R81W | 22 | | | I |
| Unnamed | Carbon | T21N | R81W | 21 | | | I |
| Kinney Creek | Carbon | T21N | R81W | 18 | | | I |
| Dana Springs Creek | Carbon | T21N | R82W | 13 | | | I |
| Martinez Springs Creek | Carbon | T21N | R82W | 13 | | | I |
| Unnamed | Carbon | T21N | R82W | 15 | | | I |
| Unnamed | Carbon | T21N | R82W | 16 | | | I |
| Unnamed | Carbon | T21N | R82W | 16 | | | I |
| Unnamed | Carbon | T21N | R82W | 17 | | | I |
| Unnamed | Carbon | T21N | R82W | 17 | | | I |
| Unnamed | Carbon | T21N | R82W | 18 | | | I |
| Unnamed | Carbon | T21N | R82W | 18 | | | I |
| Unnamed | Carbon | T21N | R82W | 18 | | | I |
| Unnamed | Carbon | T21N | R83W | 14 | | | I |
| Unnamed | Carbon | T21N | R83W | 15 | | | I |
| Unnamed | Carbon | T21N | R83W | 17 | | | I |
| Unnamed | Carbon | T21N | R84W | 25 | | | I |
| Unnamed | Carbon | T21N | R84W | 34 | | | I |
| Unnamed | Carbon | T21N | R84W | 32 | | | I |
| North Platte River | Carbon | T21N | R85W | 35 | 128 | 20-50 | P |
| Unnamed | Carbon | T21N | R85W | 33 | | | I |

Table D-1. Mining Claims, Mill Locations Covering Or Near Property (Map CM-MAP) (continued)

| Name | County | Township | Range | Section | Millsite | Approx. Width | Type* |
|---|---|---|---|---|---|---|---|
| **Mining Claims (cont'd)** | | | | | | | |
| Iron Mule Creek | Carbon | T13N | R79W | 29 | | | 6 |
| Rock Creek | Carbon | T14N | R78W | 19 | 83 | Undetermined | 5 |
| Rock Creek Ext. #1 | Carbon | T13N | R79W | 13 | | | 1 |
| Rock Creek Ext. #2 | Carbon | T13N | R79W | 13 | | | 1 |
| Unnamed | Carbon | T13N | R79W | 3 | | | 1 |
| Unnamed Creek | Carbon | T13N | R79W | 11 | 80 | 2-5 | 4 |
| Unnamed Iron Mine | Carbon | T13N | R80W | 15 | 96 | 4-15 | 5 |
| Unnamed | Carbon | T13N | R80W | 9 | | | 1 |
| Unnamed | Carbon | T13N | R81W | 23 | | | 1 |
| Unnamed | Carbon | T13N | R81W | 22 | | | 1 |
| Unnamed | Carbon | T13N | R81W | 25 | | | 1 |
| Unnamed | Carbon | T13N | R81W | 21 | | | 1 |
| Unnamed Creek | Carbon | T13N | R81W | 16 | | | 1 |
| Unnamed Spring Creek | Carbon | T13N | R81W | 15 | | | 1 |
| Unnamed | Carbon | T13N | R81W | 14 | | | 1 |
| Unnamed | Carbon | T13N | R81W | 14 | | | 1 |
| Unnamed | Carbon | T13N | R81W | 14 | | | 1 |
| Unnamed | Carbon | T13N | R81W | 13 | | | 1 |
| Unnamed | Carbon | T13N | R81W | 17 | | | 1 |
| Unnamed | Carbon | T13N | R81W | 17 | | | 1 |
| Unnamed | Carbon | T13N | R82W | 13 | | | 1 |
| Unnamed | Carbon | T13N | R82W | 13 | | | 1 |
| Unnamed | Carbon | T13N | R82W | 12 | | | 1 |
| Unnamed | Carbon | T13N | R82W | 12 | | | 1 |
| Unnamed | Carbon | T13N | R82W | 12 | | | 1 |
| Unnamed | Carbon | T13N | R82W | 11 | | | 1 |
| Unnamed | Carbon | T13N | R82W | 10 | | | 1 |
| Unnamed | Carbon | T13N | R82W | 10 | | | 1 |
| Unnamed | Carbon | T13N | R82W | 9 | | | 1 |
| Unnamed | Carbon | T13N | R82W | 8 | | | 1 |
| Unnamed | Carbon | T13N | R82W | 8 | | | 1 |
| Unnamed | Carbon | T13N | R82W | 7 | | | 1 |
| Unnamed | Carbon | T13N | R82W | 7 | | | 1 |
| Unnamed | Carbon | T13N | R82W | 7 | | | 1 |
| Unnamed | Carbon | T13N | R82W | 6 | | | 1 |
| Unnamed | Carbon | T13N | R82W | 6 | | | 1 |
| Unnamed | Carbon | T13N | R82W | 6 | | | 1 |
| Unnamed | Carbon | T13N | R82W | 5 | | | 1 |
| Unnamed | Carbon | T13N | R82W | 5 | | | 1 |
| Unnamed | Carbon | T13N | R82W | 5 | | | 1 |
| Unnamed | Carbon | T13N | R82W | 4 | | | 1 |
| Unnamed | Carbon | T13N | R82W | 4 | | | 1 |
| Unnamed | Carbon | T13N | R82W | 4 | | | 1 |
| Unnamed | Carbon | T13N | R82W | 3 | | | 1 |
| Unnamed | Carbon | T13N | R82W | 3 | | | 1 |
| Unnamed | Carbon | T13N | R82W | 3 | | | 1 |
| Unnamed | Carbon | T13N | R82W | 2 | | | 1 |
| Unnamed | Carbon | T13N | R82W | 2 | | | 1 |
| Unnamed | Carbon | T13N | R82W | 2 | | | 1 |
| Unnamed | Carbon | T13N | R82W | 1

Table D-1. RIVERS, CREEKS, AND DRAINAGES CROSSED BY THE PROJECT RIGHT-OF-WAY (continued)

| Name | County | Township | Range | Section | Milepost | Approx. Width | Type[a] |
|---|---|---|---|---|---|---|---|
| WYOMING (cont'd) | | | | | | | |
| Unnamed | Sweetwater | T15N | R117W | 10 | | | I |
| Muddy Creek | Sweetwater | T15N | R117W | 10 | | | I |
| Soda Hollow | Sweetwater | T15N | R117W | 17 | | | I |
| Antelope Creek | Sweetwater | T15N | R118W | 24 | | | I |
| Unnamed | Sweetwater | T15N | R118W | 19 | | | I |
| Unnamed | Sweetwater | T15N | R119W | 20 | | | I |
| Unnamed | Sweetwater | T15N | R119W | 19 | | | I |
| Bear River | Sweetwater | T15N | R120W | 22 | 365 | | P |
| Unnamed | Sweetwater | T15N | R120W | 28 | | | I |
| Unnamed | Uinta | T15N | R119W | 30 | | | I |
| Bear River | Uinta | T15N | R120W | 26 | 347 | | P |
| Unnamed Ditch | Uinta | T15N | R120W | 27 | | | I |
| Aqueduct | Uinta | T15N | R120W | 28 | | | I |
| Unnamed | Uinta | T15N | R120W | 28 | | | I |
| Yellow Creek | Uinta | T15N | R121W | 25 | | | P |
| Unnamed | Uinta | T15N | R121W | 26 | | | I |
| UTAH | | | | | | | |
| Wasatch Creek | Rich | T16N | R8E | 20 | | | I |
| Shearing Corral Creek | Rich | T6N | R7E | 27 | 5 | 2-5' | P |
| Unnamed | Morgan | T6N | R6E | 36 | | | I |
| Unnamed | Morgan | T6N | R6E | 35 | | | I |
| Unnamed | Morgan | T6N | R6E | 35 | | | P |
| Francis Canyon | Morgan | T5N | R5E | 10 | | | P(?) |
| Lost Creek | Morgan | | | | | | P |
| Lost Creek | Morgan | | | | | | P |
| Lost Creek | Morgan | | | | | | P |
| Lost Creek | Morgan | | | | | | P |
| Lost Creek | Morgan | T4N | R4E | 19 | | | P |

Table D-1. RIVERS, CREEKS, AND DRAINAGES CROSSED BY THE PROJECT RIGHT-OF-WAY (continued)

| Name | County | Township | Range | Section | Milepost | Approx. Width | Type[a] |
|---|---|---|---|---|---|---|---|
| UTAH (cont'd) | | | | | | | |
| Weber River | Morgan | T4N | R4E | 30 | 31.7 | | P |
| Powder Hollow | Morgan | T4N | R4E | 30 | | | I |
| Tunnel Hollow | Morgan | T4N | R3E | 27 | | | I |
| Phil Shop Hollow | Morgan | T4N | R3E | 28 | | | I |
| Weber River | Morgan | T4N | R3E | 31 | 36 | | P |
| Unnamed | Morgan | T4N | R2E | 16 | | | I |
| Weber River | Morgan | T4N | R2E | 6 | 42.6 | | P |
| Unnamed | Morgan | T5N | R1E | 26 | | | I |
| Gordon Creek | Morgan | T5N | R1E | 26 | | | I |
| Strawberry Creek | Morgan | T5N | R1E | 27 | | | I |
| Unnamed | Davis | T5N | R1E | 29 | | | I |
| Unnamed | Davis | T5N | R1E | 29 | | | I |
| Davis Weber Canal | Davis | T5N | R1W | 25 | | | I |
| Unnamed | Davis | T5N | R1W | 25 | | | I |
| Unnamed | Davis | T5N | R1W | 26 | | | I |
| Unnamed | Davis | T5N | R1W | 34 | | | I |
| Davis Weber Canal | Davis | T5N | R1W | 34 | | | I |
| Unnamed | Davis | T4N | R1W | 10 | | | I |
| Kays Creek | Davis | T4N | R1W | 10 | 57 | 2-5' | P |
| Kays Creek, South Fork | Davis | T4N | R1W | 15 | 59 | 2-5' | P |
| Snow Creek | Davis | T4N | R1W | 22 | | | I |
| North Fork Holmes Creek | Davis | T4N | R1W | 23 | | | I |
| Unnamed | Davis | T4N | R1W | 23 | | | I |
| Unnamed | Davis | T4N | R1W | 26 | | | I |
| Holmes Creek | Davis | T4N | R1W | 26 | | | I |
| Holmes Creek | Davis | T4N | R1W | 26 | | | I |
| Unnamed | Davis | T4N | R1W | 35 | | | I |
| Baer Creek | Davis | T3N | R1W | 2 | | | I |
| Haight Creek | Davis | T3N | R1W | 11 | | | I |
| Farmington Creek | Davis | T3N | R1W | 24 | | | I |
| Unnamed | Davis | T1N | R1W | 3 | | | I |
| Jordan River | Salt Lake | T1N | R1W | 4 | 80 | | P |

Table D-1. RIVERS, CREEKS, AND DRAINAGES CROSSED BY THE PROJECT RIGHT-OF-WAY (continued)

| Name | County | Township | Range | Section | Milepost | Approx. Width | Type[a] |
|---|---|---|---|---|---|---|---|
| UTAH (cont'd) | | | | | | | |
| Consolidated Canal | Salt Lake | T1N | R1W | 30 | | | P |
| Surplus Canal | Salt Lake | T1N | R1W | 30 | | | P |
| Unnamed | Salt Lake | T1N | R2W | 36 | | | P |
| Unnamed | Salt Lake | T1S | R2W | 1 | | | I |
| Brighton Canal | Salt Lake | T1S | R2W | 1 | | | I |
| Unnamed | Salt Lake | T1S | R2W | 12 | | | I |
| Unnamed | Salt Lake | T1S | R2W | 14 | | | I |
| Riter Canal | Salt Lake | T1S | R2W | 23 | | | P |
| Utah & Salt Lake Canal | Salt Lake | T1S | R2W | 35 | | | I |
| Unnamed | Salt Lake | T2S | R2W | 35 | | | I |
| Barneys Creek | Salt Lake | T2S | R2W | 35 | | | I |
| Barneys Wash | Salt Lake | T3S | R2W | 2 | | | I |
| Bingham Creek | Salt Lake | T3S | R2W | 2 | | | I |
| Unnamed | Salt Lake | T3S | R2W | 14 | | | P |
| Midas Creek | Salt Lake | T3S | R2W | 25 | | | I |
| Reservoir Canal | Salt Lake | T3S | R1W | 31 | | | I |
| Rose Creek | Salt Lake | T4S | R1W | 5 | 94 | 2-10' | I |
| Unnamed | Salt Lake | T4S | R1W | 5 | | | I |
| Provo Reservoir Canal | Salt Lake | T4S | R1W | 22 | | | P |
| Beef Hollow Creek | Salt Lake | T4S | R1W | 27 | 96 | 2-5' | I |
| Provo Reservoir Canal | Salt Lake | T4S | R1W | 34 | | | P |
| Utah Lake Distrib. Canal | Utah | T5S | R1W | 11 | | | P |
| Utah Lake Distrib. Canal | Utah | T5S | R1W | 15 | | | P |
| Unnamed | Utah | T5S | R1W | 15 | | | P |
| Unnamed | Utah | T5S | R1W | 15 | | | I |
| Unnamed | Utah | T5S | R1W | 17 | | | I |
| Tickville Gulch | Utah | T5S | R2W | 13 | | | I |
| Oak Springs Hollow | Utah | T5S | R2W | 24 | | | I |
| West Canyon Wash | Utah | T5S | R2W | 23 | 108 | 2-5' | I |
| Cedar Fort Ditch | Utah | T5S | R2W | 32 | | | I |

Table D-1. RIVERS, CREEKS, AND DRAINAGES CROSSED BY THE PROJECT RIGHT-OF-WAY (continued)

| Name | County | Township | Range | Section | Milepost | Approx. Width | Type[a] |
|---|---|---|---|---|---|---|---|
| UTAH (cont'd) | | | | | | | |
| Four Mile Canyon | Utah | T5S | R2W | 32 | | | I |
| Unnamed | Utah | T5S | R2W | 31 | | | I |
| Big Spring Creek | Utah | T6S | R2W | 29 | 117 | 2-10' | I |
| Unnamed | Utah | T6S | R2W | 31 | | | I |
| Wells Canyon | Utah | T6S | R3W | 36 | | | I |
| Unnamed | Utah | T7S | R3W | 3 | | | I |
| Unnamed | Toole | T7S | R3W | 17 | | | I |
| Unnamed | Toole | T7S | R3W | 20 | | | I |
| Unnamed | Toole | T8S | R3W | 7 | | | I |
| Unnamed | Toole | T8S | R4W | 24 | | | I |
| Unnamed | Toole | T9S | R4W | 2 | | | I |
| Unnamed | Toole | T9S | R4W | 12 | | | I |
| Boulter Creek | Toole | T9S | R4W | 10 | 136 | 2-5' | I |
| Unnamed | Toole | T9S | R4W | 27 | | | I |
| Unnamed | Toole | T9S | R4W | 34 | | | I |
| Unnamed | Toole | T9S | R4W | 35 | | | I |
| Unnamed | Toole | T10S | R4W | 11 | | | I |
| Unnamed | Juab | T10S | R3W | 20 | | | I |
| Unnamed | Juab | T10S | R3W | 27 | | | I |
| Eureka Creek | Juab | T10S | R3W | 27 | | | I |
| Mammoth Gulch | Juab | T11S | R3W | 11 | 152 | 2-5' | I |
| Diamond Gulch | Juab | T11S | R3W | 14 | 153 | 2-5' | I |
| Unnamed | Juab | T11S | R3W | 23 | | | I |
| Unnamed | Juab | T11S | R3W | 35 | | | I |
| Copperopolis Creek | Juab | T11½S | R3W | 2 | 159 | 2-5' | I |
| Unnamed | Juab | T12S | R3W | 11 | | | I |
| Unnamed | Juab | T12S | R3W | 11 | | | I |
| Unnamed | Juab | T12S | R3W | 14 | | | I |
| Hop Creek | Juab | T12S | R3W | 23 | 163 | 2-5' | I |
| Unnamed | Juab | T12S | R3W | 33 | | | I |

Table D-1. RIVERS, CREEKS, AND DRAINAGES CROSSED BY THE PROJECT RIGHT-OF-WAY (continued)

| Name | County | Township | Range | Section | Milepost | Approx. Width | Type[a] |
|---|---|---|---|---|---|---|---|
| UTAH (cont'd) | | | | | | | |
| Unnamed | Juab | T13S | R3W | 8 | | | I |
| Unnamed | Juab | T13S | R3W | 18 | | | I |
| Unnamed | Juab | T13S | R4W | 13 | | | I |
| Unnamed | Juab | T13S | R4W | 23 | | | I |
| Unnamed | Juab | T13S | R4W | 23 | | | I |
| Unnamed | Juab | T13S | R4W | 27 | | | I |
| Unnamed | Juab | T15S | R5W | 12 | | | I |
| Sevier River | Millard | T16S | R6W | 26 | 190.9 | 20-40' | P |
| Unnamed | Millard | T16S | R6W | 27 | | | I |
| Unnamed (Ditch) | Millard | T17S | R6W | 5 | | | I |
| Unnamed (Ditch) | Millard | T17S | R6W | 8 | | | I |
| Unnamed (Ditch) | Millard | T17S | R6W | 20 | | | I |
| Unnamed (Ditch) | Millard | T17S | R6W | 29 | | | I |
| Unnamed (Ditch) | Millard | T17S | R6W | 32 | | | I |
| Unnamed (Ditch) | Millard | T18S | R6W | 6 | | | I |
| Unnamed (Ditch) | Millard | T18S | R7W | 1 | | | I |
| Unnamed (Ditch) | Millard | T18S | R7W | 1 | | | I |
| Unnamed (Ditch) | Millard | T18S | R7W | 2 | | | I |
| Unnamed (Ditch) | Millard | T18S | R7W | 2 | | | I |
| Unnamed (Ditch) | Millard | T18S | R7W | 2 | | | I |
| Unnamed (Ditch) | Millard | T18S | R7W | 3 | | | I |
| Old Sevier River Channel | Millard | T18S | R7W | 4 | | | I |
| North Ditch | Millard | T18S | R7W | 5 | | | I |
| Old Sevier River Channel | Millard | T18S | R7W | 9 | | | I |
| Old Sevier River Channel | Millard | T18S | R7W | 17 | | | I |
| Old Sevier River Channel | Millard | T19S | R8W | 1 | | | I |
| Beaver River | Millard | T20S | R8W | 21 | 222 | 2-10' | I |
| Unnamed | Millard | T20S | R8W | 32 | | | I |
| Beaver River | Millard | T21S | R8W | 7 | 225 | 2-10' | I |
| Unnamed | Millard | T22S | R9W | 14 | | | I |

Table D-1. RIVERS, CREEKS, AND DRAINAGES CROSSED BY THE PROJECT RIGHT-OF-WAY (continued)

| Name | County | Township | Range | Section | Milepost | Approx. Width | Type[a] |
|---|---|---|---|---|---|---|---|
| UTAH (cont'd) | | | | | | | |
| Unnamed | Millard | T22S | R9W | 23 | | | I |
| Unnamed | Millard | T22S | R9W | 23 | | | I |
| Unnamed | Millard | T22S | R9W | 26 | | | I |
| Unnamed | Millard | T22S | R9W | 26 | | | I |
| Unnamed | Millard | T22S | R9W | 35 | | | I |
| Unnamed | Millard | T22S | R9W | 34 | | | I |
| Unnamed | Millard | T23S | R9W | 16 | | | I |
| Unnamed | Millard | T23S | R9W | 16 | | | I |
| Unnamed | Millard | T23S | R9W | 17 | | | I |
| Unnamed | Millard | T23S | R9W | 20 | | | I |
| Unnamed | Millard | T23S | R9W | 19 | | | I |
| Unnamed | Millard | T23S | R9W | 19 | | | I |
| Unnamed | Millard | T23S | R9W | 30 | | | I |
| Unnamed | Millard | T23S | R10W | 25 | | | I |
| Unnamed | Millard | T23S | R10W | 25 | | | I |
| Unnamed | Millard | T23S | R10W | 35 | | | I |
| Unnamed | Millard | T23S | R10W | 35 | | | I |
| Unnamed | Millard | T24S | R10W | 2 | | | I |
| Beaver River | Millard | T24S | R10W | 15 | 248 | 2-10' | I |
| Unnamed | Millard | T24S | R10W | 28 | | | I |
| Unnamed | Millard | T25S | R10W | 16 | | | I |
| Cove Creek | Millard | T25S | R10W | 28 | 256 | 2-5' | I |
| Unnamed | Beaver | T26S | R10W | 32 | | | I |
| Beaver River | Beaver | T27S | R10W | 17 | 266 | 2-5' | I |
| Beaver River | Beaver | T28S | R10W | 7 | 271 | 2-5' | I |
| Beaver River | Beaver | T28S | R10W | 30 | 275 | 2-5' | I |
| Beaver River | Beaver | T29S | R10W | 5 | 276 | 2-5' | I |
| Beaver River | Beaver | T29S | R10W | 8 | 277 | 2-5' | I |
| Unnamed | Beaver | T30S | R11W | 18 | | | I |
| Unnamed | Beaver | T30S | R11W | 18 | | | I |

Table D-1. RIVERS, CREEKS, AND DRAINAGES CROSSED BY THE PROJECT RIGHT-OF-WAY (continued)

| Name | County | Township | Range | Section | Milepost | Approx. Width | Type[a] |
|---|---|---|---|---|---|---|---|
| UTAH (cont'd) | | | | | | | |
| Unnamed | Beaver | T30S | R12W | 24 | | | I |
| Unnamed | Beaver | T30S | R12W | 34 | | | I |
| Fourmile Wash | Iron | T33S | R15W | 2 | | | I |
| Unnamed | Iron | T33S | R15W | 17 | | | I |
| Unnamed | Iron | T33S | R15W | 17 | | | I |
| Unnamed | Iron | T33S | R15W | 18 | | | I |
| Mountain Spring Wash | Iron | T33S | R16W | 24 | | | I |
| Unnamed | Iron | T33S | R16W | 28 | | | I |
| Unnamed | Iron | T33S | R17W | 25 | | | I |
| Unnamed | Iron | T33S | R17W | 27 | | | I |
| Unnamed | Iron | T33S | R17W | 28 | | | I |
| Unnamed | Iron | T33S | R17W | 29 | | | I |
| Unnamed | Iron | T33S | R17W | 30 | | | I |
| Unnamed | Iron | T33S | R18W | 25 | | | I |
| Unnamed | Iron | T33S | R18W | 26 | | | I |
| Tillie Creek | Iron | T33S | R18W | 27 | | | I |
| Mary's Hollow | Iron | T33S | R18W | 27 | | | I |
| Unnamed | Iron | T33S | R18W | 33 | | | I |
| Unnamed | Iron | T34S | R18W | 5 | | | I |
| Unnamed | Iron | T34S | R18W | 5 | | | I |
| Unnamed | Iron | T34S | R18W | 8 | | | I |
| Unnamed | Iron | T34S | R18W | 18 | | | I |
| Unnamed | Iron | T34S | R18W | 19 | | | I |
| McDonald Wash | Iron | T34S | R19W | 25 | | | I |
| Unnamed | Iron | T34S | R19W | 36 | | | I |
| Unnamed | Iron | T35S | R19W | 3 | | | I |
| Unnamed | Iron | T35S | R19W | 3 | | | I |
| Gold Springs Wash | Iron | T35S | R19W | 4 | | | I |
| Unnamed | Iron | T35S | R19W | 9 | | | I |
| Unnamed | Iron | T35S | R19W | 17 | | | I |

Table D-1. RIVERS, CREEKS, AND DRAINAGES CROSSED BY THE PROJECT RIGHT-OF-WAY (continued)

| Name | County | Township | Range | Section | Milepost | Approx. Width | Type[a] |
|---|---|---|---|---|---|---|---|
| UTAH (cont'd) | | | | | | | |
| Unnamed | Iron | T35S | R19W | 17 | | | I |
| Unnamed | Iron | T35S | R19W | 17 | | | P |
| Unnamed | Iron | T35S | R20W | 25 | | | P |
| NEVADA | | | | | | | |
| Unnamed | Lincoln | T2S | R71E | 33 | | | I |
| Unnamed | Lincoln | T2S | R70E | 36 | | | I |
| Unnamed | Lincoln | T2S | R70E | 35 | | | I |
| Lien Draw | Lincoln | T2S | R70E | 20 | | | I |
| Unnamed | Lincoln | T2S | R70E | 18 | | | I |
| Unnamed | Lincoln | T2S | R69E | 18 | | | I |
| Unnamed | Lincoln | T2S | R69E | 13 | | | I |
| Unnamed | Lincoln | T2S | R69E | 12 | | | I |
| Unnamed | Lincoln | T2S | R69E | 12 | | | I |
| Unnamed | Lincoln | T2S | R69E | 9 | | | I |
| Unnamed | Lincoln | T2S | R68E | 12 | | | I |
| Unnamed | Lincoln | T2S | R68E | 8 | | | I |
| Unnamed | Lincoln | T2S | R68E | 8 | | | I |
| Unnamed | Lincoln | T2S | R68E | 18 | | | I |
| Unnamed | Lincoln | T2S | R67E | 24 | | | I |
| Unnamed | Lincoln | T2S | R67E | 35 | | | I |
| Unnamed | Lincoln | T3S | R67E | 2 | | | I |
| Unnamed | Lincoln | T3S | R67E | 10 | | | I |
| Chief Canyon | Lincoln | T3S | R67E | 15 | | | I |
| Unnamed | Lincoln | T3S | R67E | 28 | | | I |
| Unnamed | Lincoln | T3S | R67E | 32 | | | I |
| Meadow Valley Creek | Lincoln | T4S | R67E | 8 | | | P |
| Meadow Valley Creek | Lincoln | T4S | R67E | 7 | | | P |
| Unnamed | Lincoln | T4S | R66E | 11 | | | I |
| Unnamed | Lincoln | T4S | R66E | 10 | | | I |
| Unnamed | Lincoln | T4S | R66E | 18 | | | I |

Table D-1. RIVERS, CREEKS, AND DRAINAGES CROSSED BY THE PROJECT RIGHT-OF-WAY (continued)

| Name | County | Township | Range | Section | Milepost | Approx. Width | Type[a] |
|---|---|---|---|---|---|---|---|
| NEVADA (cont'd) | | | | | | | |
| Unnamed | Lincoln | T4S | R65E | 14 | | | I |
| Unnamed | Lincoln | T4S | R65E | 14 | | | I |
| Unnamed | Lincoln | T4S | R65E | 16 | | | I |
| Unnamed | Lincoln | T4S | R65E | 8 | | | I |
| Unnamed | Lincoln | T4S | R65E | 7 | | | I |
| Unnamed | Lincoln | T4S | R65E | 7 | | | I |
| Unnamed | Lincoln | T4S | R64E | 11 | | | I |
| Red Rock Wash | Lincoln | T4S | R64E | 15 | | | I |
| Unnamed | Lincoln | T4S | R64E | 22 | | | I |
| Unnamed | Lincoln | T4S | R64E | 22 | | | I |
| Unnamed | Lincoln | T4S | R64E | 22 | | | I |
| Unnamed | Lincoln | T4S | R64E | 27 | | | I |
| Unnamed | Lincoln | T4S | R64E | 28 | | | I |
| Unnamed | Lincoln | T4S | R64E | 33 | | | I |
| Unnamed | Lincoln | T4S | R64E | 33 | | | I |
| Cottonwood Wash | Lincoln | T5S | R64E | 4 | | | I |
| Unnamed | Lincoln | T5S | R64E | 4 | | | ? |
| Aqueduct | Lincoln | T5S | R64E | 9 | | | I |
| Unnamed | Lincoln | T5S | R64E | 16 | | | I |
| Unnamed | Lincoln | T5S | R64E | 17 | | | I |
| Unnamed | Lincoln | T5S | R64E | 17 | | | I |
| Unnamed | Lincoln | T5S | R64E | 20 | | | I |
| Monkey Wrench Wash | Lincoln | T5S | R64E | 29 | | | I |
| Unnamed | Lincoln | T5S | R64E | 31 | | | I |
| Unnamed | Lincoln | T5S | R64E | 31 | | | I |
| Unnamed | Lincoln | T6S | R64E | 6 | | | I |
| Unnamed | Lincoln | T6S | R64E | 6 | | | I |
| Helene Wash | Lincoln | T6S | R63E | 12 | | | I |
| Delemare Wash | Lincoln | T6S | R63E | 12 | | | I |
| Unnamed | Lincoln | T78 | R63E | 3 | | | I |
| Jumbo Wash | Lincoln | T7S | R63E | 10 | | | I |
| Unnamed | | | | | | | |

Table D-1. RIVERS, CREEKS, AND DRAINAGES CROSSED BY THE PROJECT RIGHT-OF-WAY (continued)

| Name | County | Township | Range | Section | Milepost | Approx. Width | Type[a] |
|---|---|---|---|---|---|---|---|
| NEVADA (cont'd) | | | | | | | |
| Delemare Lake Bed | Lincoln | T7S | R63E | 28 | | | I |
| Unnamed | Lincoln | T7S | R63E | 33 | | | I |
| Unnamed | Lincoln | T7S | R63E | 32 | | | I |
| Unnamed | Lincoln | T8S | R63E | 5 | | | I |
| Unnamed | Lincoln | T8S | R63E | 5 | | | I |
| Unnamed | Lincoln | T8S | R63E | 5 | | | I |
| Unnamed | Lincoln | T8S | R63E | 19 | | | I |
| Unnamed | Lincoln | T8S | R62E | 25 | | | I |
| Unnamed | Lincoln | T8S | R62E | 35 | | | I |
| Pahranagat Wash | Lincoln | T9S | R62E | 10 | | | I |
| Unnamed | Lincoln | T9S | R62E | 14 | | | I |
| Unnamed | Lincoln | T9S | R62E | 14 | | | I |
| Unnamed | Lincoln | T9S | R62E | 23 | | | I |
| Unnamed | Lincoln | T9S | R62E | 23 | | | I |
| Unnamed | Lincoln | T9S | R62E | 26 | | | I |
| Unnamed | Lincoln | T9S | R62E | 26 | | | I |
| Unnamed | Lincoln | T9S | R62E | 35 | | | I |
| Unnamed | Lincoln | T9S | R62E | 35 | | | I |
| Unnamed | Lincoln | T10S | R62E | 2 | | | I |
| Unnamed | Lincoln | T10S | R62E | 13 | | | I |
| Unnamed | Lincoln | T10S | R62E | 36 | | | I |
| Unnamed | Lincoln | T11S | R62E | 1 | | | I |
| Unnamed | Lincoln | T11S | R62E | 12 | | | I |
| Unnamed | Lincoln | T11S | R62E | 12 | | | I |
| Unnamed | Lincoln | T11S | R62E | 13 | | | I |
| Unnamed | Lincoln | T11S | R62E | 24 | | | I |
| Unnamed | Lincoln | T11S | R63E | 19 | | | I |
| Unnamed | Lincoln | T11S | R63E | 31 | | | I |
| Unnamed | Lincoln | T11S | R63E | 31 | | | I |
| Unnamed | Lincoln | T12S | R63E | 6 | | | I |
| Unnamed | Lincoln | T12S | R63E | 6 | | | I |

Table D-1. RIVERS, CREEKS, AND DRAINAGES CROSSED BY THE PROJECT RIGHT-OF-WAY (continued)

| Name | County | Township | Range | Section | Milepost | Approx. Width | Type[a] |
|---|---|---|---|---|---|---|---|
| NEVADA (cont'd) | | | | | | | |
| Unnamed | Lincoln | T12S | R63E | 6 | | | I |
| Unnamed | Lincoln | T12S | R63E | 7 | | | I |
| Unnamed | Lincoln | T12S | R63E | 7 | | | I |
| Unnamed | Lincoln | T12S | R63E | 7 | | | I |
| Unnamed | Lincoln | T12S | R63E | 18 | | | I |
| Unnamed | Lincoln | T12S | R63E | 18 | | | I |
| Unnamed | Lincoln | T12S | R63E | 19 | | | I |
| Unnamed | Lincoln | T12S | R63E | 19 | | | I |
| Unnamed | Lincoln | T12S | R63E | 30 | | | I |
| Unnamed | Lincoln | T12S | R63E | 30 | | | I |
| Unnamed | Lincoln | T12S | R63E | 32 | | | I |
| Unnamed | Lincoln | T12S | R63E | 32 | | | I |
| Unnamed | Clark | T13S | R63E | 5 | | | I |
| Unnamed | Clark | T13S | R63E | 5 | | | I |
| Unnamed | Clark | T13S | R63E | 5 | | | I |
| Unnamed | Clark | T13S | R63E | 5 | | | I |
| Unnamed | Clark | T13S | R63E | 8 | | | I |
| Unnamed | Clark | T13S | R63E | 17 | | | I |
| Unnamed | Clark | T13S | R63E | 17 | | | I |
| Unnamed | Clark | T13S | R63E | 17 | | | I |
| Unnamed | Clark | T13S | R63E | 20 | | | I |
| Unnamed | Clark | T13S | R63E | 29 | | | I |
| Unnamed | Clark | T13S | R63E | 29 | | | I |
| Unnamed | Clark | T13S | R63E | 29 | | | I |
| Unnamed | Clark | T13S | R63E | 29 | | | I |
| Unnamed | Clark | T13S | R63E | 33 | | | I |
| Unnamed | Clark | T13S | R63E | 33 | | | I |
| Unnamed | Clark | T13½S | R63E | 32 | | | I |
| Unnamed | Clark | T13½S | R63E | 33 | | | I |
| Unnamed | Clark | T13½S | R63E | 33 | | | I |
| Unnamed | Clark | T13½S | R63E | 33 | | | I |

Table D-1. RIVERS, CREEKS, AND DRAINAGES CROSSED BY THE PROJECT RIGHT-OF-WAY (continued)

| Name | County | Township | Range | Section | Milepost | Approx. Width | Type[a] |
|---|---|---|---|---|---|---|---|
| NEVADA (cont'd) | | | | | | | |
| Unnamed | Clark | T14S | R63E | 4 | | | I |
| Unnamed | Clark | T14S | R63E | 16 | | | I |
| Unnamed | Clark | T14S | R63E | 16 | | | I |
| Unnamed | Clark | T14S | R63E | 21 | | | I |
| Unnamed | Clark | T14S | R63E | 21 | | | I |
| Unnamed | Clark | T14S | R63E | 28 | | | I |
| Unnamed | Clark | T14S | R63E | 28 | | | I |
| Unnamed | Clark | T14S | R63E | 28 | | | I |
| Unnamed | Clark | T19S | R63E | 19 | | | I |
| Unnamed | Clark | T19S | R62E | 26 | | | I |
| Unnamed | Clark | T19S | R62E | 34 | | | I |
| Unnamed | Clark | T20S | R62E | 5 | | | I |
| Unnamed | Clark | T20S | R62E | 8 | | | I |
| Las Vegas Wash | Clark | T20S | R61E | 13 | | | I |
| Unnamed | Clark | T20S | R61E | 27 | | | I |
| Flamingo Wash | Clark | T21S | R61E | 17 | | | I |
| Tropicana Wash | Clark | T21S | R61E | 29 | | | I |
| Unnamed | Clark | T21S | R61E | 29 | | | I |
| Unnamed | Clark | T21S | R61E | 32 | | | I |
| Unnamed | Clark | T22S | R61E | 8 | | | I |
| Unnamed | Clark | T22S | R61E | 17 | | | I |
| Unnamed | Clark | T22S | R61E | 20 | | | I |
| Unnamed | Clark | T22S | R61E | 20 | | | I |
| Duck Creek | Clark | T22S | R61E | 29 | | | I |
| Unnamed | Clark | T22S | R61E | 32 | | | I |
| Unnamed | Clark | T23S | R61E | 20 | | | I |
| Unnamed | Clark | T24S | R60E | 1 | | | I |
| Unnamed | Clark | T24S | R60E | 15 | | | I |
| Unnamed | Clark | T24S | R60E | 29 | | | I |
| Unnamed | Clark | T24S | R60E | 31 | | | I |
| Unnamed | Clark | T24S | R60E | 31 | | | I |

Table D-1. RIVERS, CREEKS, AND DRAINAGES CROSSED BY THE PROJECT RIGHT-OF-WAY (continued)

| Name | County | Township | Range | Section | Milepost | Approx. Width | Type[a] |
|---|---|---|---|---|---|---|---|
| NEVADA (cont'd) | | | | | | | |
| Unnamed | Clark | T25S | R59E | 1 | | | I |
| Unnamed | Clark | T25S | R59E | 12 | | | I |
| CALIFORNIA | | | | | | | |
| (Proposed Route) | San Bernardino | T17N | R13E | 4 | | | I |
| Unnamed | San Bernardino | T17N | R13E | 6 | | | I |
| Unnamed | San Bernardino | T17N | R12E | 12 | | | I |
| Unnamed | San Bernardino | T17N | R12E | 11 | | | I |
| Unnamed | San Bernardino | T17N | R12E | 20 | | | I |
| Kingston Wash | San Bernardino | T17N | R11E | 24 | | | I |
| Unnamed | San Bernardino | T17N | R11E | 32 | | | I |
| Unnamed | San Bernardino | T17N | R10E | 36 | | | I |
| Unnamed | San Bernardino | T16N | R10E | 1 | | | I |
| Unnamed | San Bernardino | T16N | R10E | 3 | | | I |
| Unnamed | San Bernardino | T16N | R10E | 11 | | | I |
| Unnamed | San Bernardino | T16N | R10E | 9 | | | I |
| Unnamed | San Bernardino | T16N | R10E | 17 | | | I |
| Riggs Wash | San Bernardino | T16N | R9E | 26 | | | I |
| Unnamed | San Bernardino | T16N | R9E | 34 | | | I |
| Unnamed | San Bernardino | T15N | R8E | 30 | | | I |
| Unnamed | San Bernardino | T13N | R5E | 24 | | | I |
| Unnamed | San Bernardino | T13N | R5E | 35 | | | I |
| Unnamed | San Bernardino | T13N | R5E | 35 | | | I |
| Unnamed | San Bernardino | T12N | R5E | 3 | | | I |
| Unnamed | San Bernardino | T12N | R5E | 17 | | | I |
| Unnamed | San Bernardino | T12N | R5E | 19 | | | I |
| Unnamed | San Bernardino | T12N | R5E | 36 | | | I |
| Unnamed | San Bernardino | T11N | R4E | 3 | | | I |
| Unnamed | San Bernardino | T11N | R4E | 17 | | | I |

Table D-1. RIVERS, CREEKS, AND DRAINAGES CROSSED BY THE PROJECT RIGHT-OF-WAY (continued)

| Name | County | Township | Range | Section | Milepost | Approx. Width | Type[a] |
|---|---|---|---|---|---|---|---|
| CALIFORNIA (cont'd) | | | | | | | |
| Mojave River Bed | San Bernardino | T9N | R2E | 4/9 | | | I |
| Unnamed | San Bernardino | T9N | R1E | 26 | | | I |
| Unnamed | San Bernardino | T9N | R1E | 26 | | | I |
| Unnamed | San Bernardino | T9N | R1E | 33 | | | I |
| Daggett Wash | San Bernardino | T8N | R1E | 6 | | | I |
| Unnamed | San Bernardino | T8N | R1W | 1 | | | I |
| Unnamed | San Bernardino | T8N | R1W | 11 | | | I |
| Unnamed | San Bernardino | T8N | R1W | 21 | | | I |
| Unnamed | San Bernardino | T8N | R1W | 20 | | | I |
| Unnamed | San Bernardino | T8N | R1W | 17 | | | I |
| Unnamed | San Bernardino | T8N | R1W | 30 | | | I |
| Unnamed | San Bernardino | T8N | R1W | 30 | | | I |
| Unnamed | San Bernardino | T8N | R1W | 30 | | | I |
| Unnamed | San Bernardino | T7N | R2W | 2 | | | I |
| Unnamed | San Bernardino | T7N | R2W | 3 | | | I |
| Unnamed | San Bernardino | T7N | R2W | 8 | | | I |
| Unnamed | San Bernardino | T7N | R2W | 21 | | | I |
| Unnamed | San Bernardino | T7N | R2W | 20 | | | I |
| Unnamed | San Bernardino | T7N | R2W | 29 | | | I |
| Wild Wash | San Bernardino | T7N | R2W | 29 | | | I |
| Unnamed | San Bernardino | T7N | R2W | 32 | | | I |
| Unnamed | San Bernardino | T6N | R3W | 1 | | | I |
| Unnamed | San Bernardino | T6N | R3W | 2 | | | I |
| Unnamed | San Bernardino | T6N | R3W | 16/17 | | | I |
| Mountain Wash | San Bernardino | T6N | R3W | 16/17 | | | I |
| Unnamed | San Bernardino | T6N | R3W | 16/17 | | | I |
| Mojave River Bed | San Bernardino | T5N | R4W | 36 | | | I |
| | | T4N | R4W | 1 | | | I |
| Unnamed | San Bernardino | T5N | R4W | 35 | | | I |
| California Aqueduct | San Bernardino | T4N | R5W | 14 | | | P |
| Unnamed | San Bernardino | T3N | R6W | 26 | | | I |

Table D-1. RIVERS, CREEKS, AND DRAINAGES CROSSED BY THE PROJECT RIGHT-OF-WAY (continued)

| Name | County | Township | Range | Section | Milepost | Approx. Width | Type[a] |
|---|---|---|---|---|---|---|---|
| WYOMING (cont'd) | | | | | | | |
| Unnamed | Carbon | T21N | R86W | 35,34 | | | I |
| Unnamed | Carbon | T21N | R86W | 31 | | | I |
| Aqueduct | Carbon | T21N | R87W | 30 | | | P |
| Coal Creek | Carbon | T21N | R87W | 30 | | | I |
| Sugar Creek | Carbon | T21N | R88W | 25 | | | I |
| Four Mile Draw | Carbon | T21N | R88W | 28 | | | I |
| Hadsell Draw | Carbon | T21N | R88W | 30 | | | I |
| Separation Creek | Carbon | T21N | R89W | 28 | | | I |
| Fillmore Creek | Sweetwater | T21N | R90W | 26 | | | I |
| Latham Draw | Sweetwater | T20N | R93W | 17 | | | I |
| Red Wash Draw | Sweetwater | T20N | R95W | 5 | | | I |
| Unnamed | Sweetwater | T20N | R95W | 6 | | | I |
| Unnamed | Sweetwater | T19N | R96W | 11 | | | I |
| Unnamed | Sweetwater | T19N | R97W | 12 | | | I |
| Unnamed | Sweetwater | T19N | R98W | 8 | | | I |
| Patrick Draw | Sweetwater | T19N | R98W | 7 | | | I |
| Unnamed | Sweetwater | T19N | R99W | 12 | | | I |
| Unnamed | Sweetwater | T19N | R99W | 7 | | | I |
| Unnamed | Sweetwater | T19N | R100W | 11 | | | I |
| Unnamed | Sweetwater | T19N | R100W | 5 | | | I |
| Unnamed | Sweetwater | T20N | R100W | 31 | | | I |
| Unnamed | Sweetwater | T20N | R101W | 36 | | | I |
| Bitter Creek | Sweetwater | T20N | R101W | 35 | | | P |
| Bitter Creek | Sweetwater | T20N | R101W | 27 | | | P |
| Bitter Creek | Sweetwater | T20N | R101W | 28 | | | P |
| Bitter Creek | Sweetwater | T20N | R101W | 29 | | | P |
| Unnamed | Sweetwater | T20N | R102W | 23 | | | I |
| Unnamed | Sweetwater | T20N | R102W | 29 | | | I |
| Unnamed | Sweetwater | T19N | R103W | 7 | | | I |
| Unnamed | Sweetwater | T19N | R104W | 14 | | | I |

Table D-1. RIVERS, CREEKS, AND DRAINAGES CROSSED BY THE PROJECT RIGHT-OF-WAY (continued)

| Name | County | Township | Range | Section | Milepost | Approx. Width | Type[a] |
|---|---|---|---|---|---|---|---|
| WYOMING (cont'd) | | | | | | | |
| Unnamed | Sweetwater | T19N | R104W | 7 | | | I |
| Unnamed | Sweetwater | T19N | R104W | 18 | | | I |
| Unnamed | Sweetwater | T19N | R105W | 14 | | | I |
| Unnamed | Sweetwater | T19N | R105W | 14 | | | I |
| Killpecker Creek | Sweetwater | T19N | R105W | 27 | | | I |
| Unnamed | Sweetwater | T19N | R105W | 15 | | | I |
| Unnamed | Sweetwater | T19N | R105W | 28 | | | I |
| Unnamed | Sweetwater | T19N | R105W | 33 | | | I |
| Unnamed | Sweetwater | T19N | R105W | 33 | | | I |
| Unnamed | Sweetwater | T18N | R105W | 5 | | | I |
| Unnamed | Sweetwater | T18N | R106W | 14 | | | I |
| Unnamed | Sweetwater | T18N | R106W | 21 | | | I |
| Green River | Sweetwater | T18N | R107W | 26 | 263 | 20-50 | P |
| Unnamed | Sweetwater | T18N | R107W | 20 | | | I |
| Unnamed | Sweetwater | T18N | R107W | 30 | | | I |
| Unnamed | Sweetwater | T18N | R108W | 20 | | | I |
| Blacks Fork | Sweetwater | T18N | R109W | 14 | | | P |
| Unnamed | Sweetwater | T18N | R109W | 17 | | | I |
| Unnamed | Sweetwater | T18N | R110W | 14 | | | I |
| Unnamed | Sweetwater | T18N | R110W | 21 | | | I |
| Unnamed | Sweetwater | T18N | R110W | 20 | | | I |
| Spider Creek | Sweetwater | T18N | R111W | 23 | | | I |
| Unnamed | Sweetwater | T18N | R111W | 22 | | | I |
| Unnamed | Sweetwater | T18N | R111W | 22 | | | I |
| Unnamed | Sweetwater | T18N | R111W | 19 | | | I |
| Unnamed | Sweetwater | T18N | R111W | 20 | | | I |
| Unnamed | Sweetwater | T18N | R112W | 24 | | | I |
| Unnamed | Sweetwater | T18N | R112W | 23 | | | I |
| Unnamed | Sweetwater | T18N | R112W | 23 | | | I |
| Unnamed | Sweetwater | T18N | R112W | 22 | | | I |

Table 6-1. Cities, towns, and unincorporated counties by this project zone of 401 (continued)

| Name | County | Township | Range | Section | Milepost | Approx. Width | Type |
|---|---|---|---|---|---|---|---|
| Virginia (cont'd) | | | | | | | |
| Unnamed | Shenandoah | 11N | 01W | 7 | | | I |
| Unnamed | Shenandoah | 11N | 01W | 18 | | | I |
| Unnamed | Shenandoah | 11N | 01W | 13 | | | I |
| Unnamed | Shenandoah | 11N | 01W | 14 | | | I |
| Unnamed | Shenandoah | 11N | 01W | 11 | | | I |
| Strasburg Town | Shenandoah | 11N | 01W | 15 | | | I |
| Unnamed | Shenandoah | 11N | 01W | 20 | | | I |
| Unnamed | Shenandoah | 11N | 01W | 24 | | | I |
| Unnamed | Shenandoah | 11N | 01W | 23 | | | I |
| Unnamed | Shenandoah | 11N | 01W | 5 | | | I |
| Unnamed | Shenandoah | 11N | 01W | 17 | | | I |
| Unnamed | Shenandoah | 11N | 01W | 21 | | | I |
| Unnamed | Shenandoah | 11N | 01W | 22 | | | I |
| Unnamed | Shenandoah | 11N | 01W | 26 | | | I |
| Unnamed | Shenandoah | 11N | 01W | 25 | | | I |
| Unnamed | Shenandoah | 11N | 01W | 31 | | | I |
| Unnamed | Shenandoah | 11N | 01W | 32 | | | I |
| Unnamed | Shenandoah | 11N | 01W | 29 | | | I |
| Unnamed | Shenandoah | 11N | 01W | 28 | | | I |
| Unnamed | Shenandoah | 11N | 01W | 27 | | | I |
| Unnamed | Shenandoah | 11N | 01W | 34 | | | I |
| Unnamed | Shenandoah | 11N | 01W | 35 | | | I |
| Unnamed | Shenandoah | 11N | 01W | 36 | | | I |

Table D-1. RIVERS, CREEKS, AND DRAINAGES CROSSED BY THE PROJECT RIGHT-OF-WAY (continued)

| Name | County | Township | Range | Section | Milepost | Approx. Width | Type[a] |
|---|---|---|---|---|---|---|---|
| WYOMING (cont'd) | | | | | | | |
| Unnamed | Uinta | T18N | R112W | 21 | | | I |
| Caterpillar Draw | Uinta | T18N | R112W | 21 | | | I |
| Unnamed | Uinta | T18N | R112W | 20 | | | I |
| Unnamed | Uinta | T18N | R112W | 20 | | | I |
| Bruff Draw | Uinta | T18N | R112W | 19 | | | I |
| Porter Hollow | Uinta | T18N | R113W | 25 | | | I |
| Unnamed | Uinta | T18N | R113W | 35 | | | I |
| Blacks Fork | Uinta | T18N | R113W | 34 | 300 | 10-20 | P |
| Unnamed | Uinta | T17N | R113W | 4 | | | I |
| Unnamed | Uinta | T17N | R113W | 8 | | | I |
| Unnamed | Uinta | T17N | R114W | 22 | | | I |
| Austin Wash | Uinta | T17N | R114W | 34 | | | I |
| Unnamed | Uinta | T16N | R115W | 12 | | | I |
| Unnamed | Uinta | T16N | R115W | 11 | | | I |
| Unnamed | Uinta | T16N | R115W | 14 | | | I |
| Unnamed | Uinta | T16N | R115W | 21 | | | I |
| Unnamed | Uinta | T16N | R115W | 29 | | | I |
| Scoop Shovel Draw | Uinta | T16N | R116W | 25 | | | I |
| Spring Creek | Uinta | T15N | R116W | 6 | | | I |
| Unnamed | Uinta | T15N | R117W | 1 | | | I |
| Unnamed | Uinta | T15N | R117W | 11 | | | I |
| Muddy Creek | Uinta | T15N | R117W | 10 | | | P |
| Soda Hollow | Uinta | T15N | R117W | 17 | | | P |
| Byrnes Draw | Uinta | T15N | R118W | 13 | | | I |
| The Boilers (E. Fk) | Uinta | T15N | R118W | 21 | | | I |
| The Boilers (W. Fk) | Uinta | T15N | R118W | 21 | | | I |
| Albert Creek | Uinta | T15N | R118W | 19 | | | I |
| Unnamed | Uinta | T15N | R118W | 19 | | | I |
| Unnamed | Uinta | T15N | R119W | 23 | | | I |
| Unnamed | Uinta | T15N | R119W | 29 | | | I |

Table D-1. RIVERS, CREEKS, AND DRAINAGES CROSSED BY THE PROJECT RIGHT-OF-WAY (continued)

| Name | County | Township | Range | Section | Milepost | Approx. Width | Type[a] |
|---|---|---|---|---|---|---|---|
| WYOMING (cont'd) | | | | | | | |
| Mountain Bell Alternative | | | | | | | |
| Clear Creek | Laramie | T13N | R67W | 1 | | | I |
| Unnamed | Laramie | T12N | R67W | 4 | | | I |
| Unnamed | Laramie | T12N | R67W | 11 | | | P |
| Lone Tree Creek | Laramie | T12N | R67W | 9 | 2 | | P |
| Duck Creek | Laramie | T12N | R67W | 16 | | | I |
| Clear Creek | Laramie | T13N | R67W | 16 | | | I |
| Aqueduct | Laramie | T13N | R68W | 13 | | | I |
| Unnamed | Laramie | T13N | R68W | 12 | | | I |
| South Fork Crow Creek | Laramie | T13N | R69W | 7 | | | P |
| Unnamed | Laramie | T13N | R71W | 2 | | | I |
| Unnamed | Laramie | T15N | R72W | 18 | | | I |
| Unnamed | Laramie | T15N | R73W | 12 | | | I |
| Unnamed | Laramie | T15N | R73W | 11 | | | I |
| Spring Creek | Laramie | T15N | R73W | 3 | | | I |
| Laramie River | Laramie | T16N | R73W | 16 | 56 | | P |
| Pioneer Canal | Laramie | T16N | R73W | 8 | | | I |
| North Canal | Laramie | T16N | R73W | 6,7 | | | I |
| Fork of North Canal | Laramie | T17N | R74W | 35,36 | | | I |
| Unnamed | Laramie | T17N | R74W | 16 | | | I |
| Little Laramie River | Laramie | T17N | R74W | 6 | 67 | | P |
| Fourmile Creek | Laramie | T18N | R75W | 36 | | | I |
| Unnamed | Laramie | T18N | R75W | 36 | | | I |
| Unnamed | Laramie | T19N | R77W | 11 | | | I |
| Unnamed | Laramie | T19N | R77W | 10 | | | I |
| Coal Bank Creek | Laramie | T19N | R77W | 4 | | | I |
| Ditch | Carbon | T20N | R77W | 31 | | | I |
| Threemile Creek | Carbon | T20N | R77W | 31 | | | I |
| Big Heart Ditch | Carbon | T20N | R77W | 31 | | | I |
| Unnamed | Carbon | T20N | R78W | 36 | | | I |

Table D-1. RIVERS, CREEKS, AND DRAINAGES CROSSED BY THE PROJECT RIGHT-OF-WAY (continued)

| Name | County | Township | Range | Section | Milepost | Approx. Width | Type[a] |
|---|---|---|---|---|---|---|---|
| WYOMING (cont'd) | | | | | | | |
| Aqueduct | Carbon | T20N | R78W | 36 | | | I |
| Big Harrison Ditch | Carbon | T20N | R78W | 36 | | | P |
| Noel Ditch | Carbon | T20N | R78W | 36 | | | I |
| Unnamed | Carbon | T20N | R78W | 26 | | | P |
| Rock Creek | Carbon | T20N | R78W | 26 | 91 | | P |
| Watkins Creek | Carbon | T20N | R78W | 26 | | | I |
| Foote Creek | Carbon | T20N | R78W | 30 | | | I |
| Unnamed | Carbon | T20N | R79W | 25 | | | I |
| Willow Springs Creek | Carbon | T20N | R79W | 28 | | | I |
| Wagonhound Creek | Carbon | T20N | R79W | 31 | 102 | | P |
| Bear Creek | Carbon | T20N | R80W | 25 | | | P |
| Ditch | Carbon | T20N | R80W | 26 | | | I |
| Unnamed | Carbon | T20N | R80W | 22 | | | I |
| Unnamed | Carbon | T20N | R80W | 21 | | | I |
| Medicine Bow River | Carbon | T20N | R80W | 20 | 107 | | P |
| Mill Creek | Carbon | T20N | R81W | 25 | | | P |
| Unnamed | Carbon | T20N | R81W | 27 | | | I |
| Unnamed | Carbon | T20N | R81W | 27 | | | I |
| Halleck Creek | Carbon | T20N | R81W | 20 | | | P |
| Unnamed | Carbon | T20N | R82W | 13 | | | I |
| Rattlesnake Creek | Carbon | T20N | R82W | 20,21 | | | P |
| Pass Creek | Carbon | T20N | R83W | 16 | | | P |
| Ditch | Carbon | T20N | R84W | 12 | | | I |
| Pass Creek | Carbon | T20N | R84W | 12 | | | P |
| Unnamed | Carbon | T21N | R85W | 28 | | | I |
| North Platte River | Carbon | T21N | R85W | 35 | 140 | | P |
| Sugar Creek | Carbon | T21N | R86W | 19 | | | P |
| Cherokee Creek | Carbon | T21N | R87W | 19 | | | I |
| Hasell Draw | Carbon | T21N | R88W | 30 | | | I |

Table B-1. RIVERS, CREEKS, AND DRAINAGES CROSSED BY THE PROJECT FLOOD-CK-MAT (continued)

| Name | County | Township | Range | Section | Milepost | Approx. Width | Type |
|---|---|---|---|---|---|---|---|
| **BEDFORD (cont'd)** | | | | | | | |
| Spoonbar | Clarion | 15N | 12W | 32 | | | 1 |
| Big Mallow Run | Clarion | 15N | 12W | 29 | | | 1 |
| Dunn Run | Clarion | 15N | 12W | 26 | | | 1 |
| Johnson | Clarion | 15N | 12W | 23 | | | 1 |
| Mead Creek | Clarion | 15N | 12W | 22 | 91 | | 1 |
| Hawkins Creek | Clarion | 15N | 12W | 21 | | | 1 |
| Jones Creek | Clarion | 15N | 12W | 20 | | | 1 |
| Dunham | Clarion | 15N | 12W | 19 | | | 1 |
| Allegheny River | Clarion | 15N | 12W | 18 | | | 1 |
| Tributary Clarion River | Clarion | 15N | 12W | 17 | | | 1 |
| Tributary Clarion River | Clarion | 15N | 12W | 16 | | | 1 |
| Tributary Clarion River | Clarion | 15N | 12W | 15 | | | 1 |
| Tributary Clarion River | Clarion | 15N | 12W | 14 | | | 1 |
| Tributary Clarion River | Clarion | 15N | 12W | 13 | | | 1 |
| Tributary Clarion River | Clarion | 15N | 12W | 12 | | | 1 |
| Tributary Clarion River | Clarion | 15N | 12W | 11 | | | 1 |
| Tributary Clarion River | Clarion | 15N | 12W | 10 | | | 1 |
| Tributary Clarion River | Clarion | 15N | 12W | 9 | | | 1 |
| Tributary Clarion River | Clarion | 15N | 12W | 8 | | | 1 |
| Tributary Clarion River | Clarion | 15N | 12W | 7 | | | 1 |
| Tributary Clarion River | Clarion | 15N | 12W | 6 | | | 1 |
| Tributary Clarion River | Clarion | 15N | 12W | 5 | | | 1 |
| Tributary Clarion River | Clarion | 15N | 12W | 4 | | | 1 |
| Tributary Clarion River | Clarion | 15N | 12W | 3 | | | 1 |
| Tributary Clarion River | Clarion | 15N | 12W | 2 | | | 1 |
| Tributary Clarion River | Clarion | 15N | 12W | 1 | | | 1 |
| Tributary Clarion River | Clarion | 15N | 11W | 6 | | | 1 |
| Tributary Clarion River | Clarion | 15N | 11W | 5 | | | 1 |
| Tributary Clarion River | Clarion | 15N | 11W | 4 | | | 1 |
| Tributary Clarion River | Clarion | 15N | 11W | 3 | | | 1 |
| Tributary Clarion River | Clarion | 15N | 11W | 2 | | | 1 |
| Tributary Clarion River | Clarion | 15N | 11W | 1 | | | 1 |
| Tributary Clarion River | Clarion | 15N | 10W | 6 | | | 1 |
| Tributary Clarion River | Clarion | 15N | 10W | 5 | | | 1 |
| Tributary Clarion River | Clarion | 15N | 10W | 4 | | | 1 |
| Tributary Clarion River | Clarion | 15N | 10W | 3 | | | 1 |
| Tributary Clarion River | Clarion | 15N | 10W | 2 | | | 1 |
| Tributary Clarion River | Clarion | 15N | 10W | 1 | | | 1 |
| Tributary Clarion River | Clarion | 15N | 9W | 6 | | | 1 |
| Tributary Clarion River | Clarion | 15N | 9W | 5 | | | 1 |
| Tributary Clarion River | Clarion | 15N | 9W | 4 | | | 1 |
| Tributary Clarion River | Clarion | 15N | 9W | 3 | | | 1 |
| Tributary Clarion River | Clarion | 15N | 9W | 2 | | | 1 |
| Tributary Clarion River | Clarion | 15N | 9W | 1 | | | 1 |
| Tributary Clarion River | Clarion | 15N | 8W | 6 | | | 1 |
| Tributary Clarion River | Clarion | 15N | 8W | 5 | | | 1 |
| Tributary Clarion River | Clarion | 15N | 8W | 4 | | | 1 |
| Tributary Clarion River | Clarion | 15N | 8W | 3 | | | 1 |
| Tributary Clarion River | Clarion | 15N | 8W | 2 | | | 1 |
| Tributary Clarion River | Clarion | 15N | 8W | 1 | | | 1 |
| Tributary Clarion River | Clarion | 15N | 7W | 6 | | | 1 |
| Tributary Clarion River | Clarion | 15N | 7W | 5 | | | 1 |
| Tributary Clarion River | Clarion | 15N | 7W | 4 | | | 1 |
| Tributary Clarion River | Clarion | 15N | 7W | 3 | | | 1 |
| Tributary Clarion River | Clarion | 15N | 7W | 2 | | | 1 |
| Tributary Clarion River | Clarion | 15N | 7W | 1 | | | 1 |

Table D-1. RIVERS, CREEKS, AND DRAINAGES CROSSED BY THE PROJECT RIGHT-OF-WAY (continued)

| Name | County | Township | Range | Section | Milepost | Approx. Width | Type[a] |
|---|---|---|---|---|---|---|---|
| WYOMING (cont'd) | | | | | | | |
| Separation Creek | Carbon | T21N | R89W | 28 | | | I |
| Fillmore Creek | Carbon | T21N | R90W | 26 | | | I |
| Latham Draw | Sweetwater | T20N | R93W | 17 | | | I |
| Unnamed | Sweetwater | T19N | R95W | 5 | | | I |
| Unnamed | Sweetwater | T19N | R95W | 6 | | | I |
| Unnamed | Sweetwater | T19N | R96W | 2 | | | I |
| Unnamed | Sweetwater | T19N | R97W | 12 | | | I |
| Unnamed | Sweetwater | T19N | R98W | 8 | | | I |
| Unnamed | Sweetwater | T19N | R98W | 8 | | | I |
| Unnamed | Sweetwater | T19N | R98W | 7 | | | I |
| Unnamed | Sweetwater | T19N | R98W | 12 | | | I |
| Unnamed | Sweetwater | T19N | R99W | 5 | | | I |
| Unnamed | Sweetwater | T19N | R100W | 1 | | | I |
| Unnamed | Sweetwater | T19N | R100W | 2 | | | I |
| Unnamed | Sweetwater | T20N | R100W | 32 | | | I |
| Unnamed | Sweetwater | T20N | R100W | 31 | | | I |
| Deadman Wash | Sweetwater | T20N | R100W | 30 | | | P |
| Unnamed | Sweetwater | T20N | R102W | 29 | | | I |
| Unnamed | Sweetwater | T19N | R104W | 13 | | | I |
| Unnamed | Sweetwater | T19N | R104W | 22 | | | I |
| Bitter Creek | Sweetwater | T19N | R105W | 25 | | | I |
| Sweetwater Creek | Sweetwater | T18N | R105W | 3 | | | I |
| Bitter Creek | Sweetwater | T18N | R105W | 6 | | | I |
| Unnamed | Sweetwater | T18N | R106W | 14 | | | I |
| Unnamed | Sweetwater | T18N | R106W | 16 | | | I |
| Green River | Sweetwater | T18N | R107W | 26 | 276 | | P |
| Unnamed | Sweetwater | T18N | R107W | 29 | | | I |
| Unnamed | Sweetwater | T18N | R107W | 30 | | | I |
| Unnamed | Sweetwater | T18N | R108W | 20 | | | I |
| Blacks Fork | Sweetwater | T18N | R109W | 14 | 290 | | P |

Table D-1. RIVERS, CREEKS, AND DRAINAGES CROSSED BY THE PROJECT RIGHT-OF-WAY (continued)

| Name | County | Township | Range | Section | Milepost | Approx. Width | Type[a] |
|---|---|---|---|---|---|---|---|
| WYOMING (cont'd) | | | | | | | |
| Unnamed | Sweetwater | T18N | R109W | 17 | | | I |
| Unnamed | Sweetwater | T18N | R110W | 14 | | | I |
| Aqueduct | Sweetwater | T18N | R111W | 12 | | | I |
| Unnamed | Sweetwater | T18N | R111W | 15 | | | I |
| Unnamed | Sweetwater | T18N | R111W | 18 | | | I |
| Unnamed | Sweetwater | T18N | R112W | 14 | | | I |
| Unnamed | Sweetwater | T18N | R112W | 11 | | | I |
| Unnamed | Sweetwater | T18N | R112W | 15 | | | I |
| Unnamed | Sweetwater | T18N | R112W | 15 | | | I |
| Unnamed | Sweetwater | T18N | R112W | 15 | | | I |
| Unnamed | Sweetwater | T18N | R112W | 16 | | | I |
| Unnamed | Sweetwater | T18N | R112W | 21 | | | I |
| Unnamed | Sweetwater | T18N | R112W | 21 | | | I |
| Unnamed | Sweetwater | T18N | R112W | 20 | | | I |
| Unnamed | Sweetwater | T18N | R112W | 19 | | | I |
| Bluff Draw | Sweetwater | T18N | R113W | 25 | | | I |
| Porter Valley | Sweetwater | T18N | R113W | 35 | | | I |
| Unnamed | Sweetwater | T18N | R113W | 2 | | | I |
| Unnamed | Sweetwater | T18N | R113W | 10 | | | I |
| Unnamed | Sweetwater | T18N | R113W | 16 | | | I |
| Blacks Fork | Sweetwater | T18N | R113W | 21 | 318 | | I |
| Unnamed | Sweetwater | T18N | R113W | 30 | | | I |
| Unnamed | Sweetwater | T16N | R114W | 5 | | | I |
| Unnamed | Sweetwater | T16N | R115W | 12 | | | I |
| Unnamed | Sweetwater | T16N | R115W | 14 | | | I |
| Unnamed | Sweetwater | T16N | R115W | 22 | | | I |
| Unnamed | Sweetwater | T16N | R115W | 29 | | | I |
| Rock Creek | Sweetwater | T16N | R116W | 32 | | | I |
| Spring Creek | Sweetwater | T16N | R116W | 31 | | | I |
| Unnamed | Sweetwater | T15N | R117W | 1 | | | I |

Table D-1. RIVERS, CREEKS, AND DRAINAGES CROSSED BY THE PROJECT RIGHT-OF-WAY (continued)

| Name | County | Township | Range | Section | Milepost | Approx. Width | Type[a] |
|---|---|---|---|---|---|---|---|
| CALIFORNIA (cont'd) | | | | | | | |
| Cajon Canyon | San Bernardino | T3N | R6W | 36 | | | P |
| Cleghorn Canyon | San Bernardino | T2N | R5W | 7 | | | I |
| Cajon Canyon | San Bernardino | T2N | R6W | 12 | | | P |
| Unnamed | San Bernardino | T2N | R6W | 13 | | | I |
| Unnamed | San Bernardino | T2N | R5W | 29 | | | I |
| Lytle Creek | San Bernardino | T1N | R5W | 8 | | | I |
| Unnamed | San Bernardino | T1N | R5W | 8 | | | I |
| Unnamed | San Bernardino | T1N | R5W | 8 | | | I |
| Unnamed | San Bernardino | T1N | R5W | 8 | | | I |
| Unnamed | San Bernardino | T1N | R6W | 26 | | | I |
| Unnamed | San Bernardino | T1N | R6W | 27 | | | I |
| Unnamed | San Bernardino | T1N | R6W | 27 | | | I |
| Etiwanda Creek | San Bernardino | T1N | R6W | 27 | | | I |
| Unnamed | San Bernardino | T1N | R6W | 32 | | | I |
| Day Creek | San Bernardino | T1N | R6W | 31/32 | | | I |
| Unnamed | San Bernardino | T1N | R6W | 31 | | | I |
| Deer Creek | San Bernardino | T1N | R7W | 36 | | | I |
| Unnamed | San Bernardino | T1N | R7W | 35 | | | I |
| Cucamonga Creek | San Bernardino | Unsurveyed | | | | | I |
| San Antonio Creek Channel | Los Angeles | Unsurveyed | | | | | I |
| Thompson Wash | Los Angeles | T1N | R8W | 32 | | | I |
| Oak Wash | Los Angeles | T1N | R8W | 32 | | | I |
| Unnamed | Los Angeles | T1N | R8W | 31 | | | I |
| Marshall Creek | Los Angeles | T1N | R9W | 36 | | | I |
| Unnamed | Los Angeles | T1N | R9W | 36 | | | I |
| San Dimas Wash | Los Angeles | T1N | R9W | 33 | | | I |
| Big Dalton Wash | Los Angeles | Unsurveyed | | | | | I |
| Unnamed | Los Angeles | Unsurveyed | | | | | I |
| Hondo Wash | Los Angeles | Unsurveyed | | | | | I |
| Unnamed | Los Angeles | Unsurveyed | | | | | I |
| Alhambra Wash | Los Angeles | Unsurveyed | | | | | I |

Table D-1. RIVERS, CREEKS, AND DRAINAGES CROSSED BY THE PROJECT RIGHT-OF-WAY (continued)

| Name | County | Township | Range | Section | Milepost | Approx. Width | Type[a] |
|---|---|---|---|---|---|---|---|
| CALIFORNIA (cont'd) | | | | | | | |
| Los Angles River (End of Proposed Route) | Los Angeles | Unsurveyed | | | | | I |
| (Alternate Route) | | | | | | | |
| Ivanpah Lake | San Bernardino | T17N | R15E | 17,19,30,31 | | | I |
| Weaton Wash | San Bernardino | T16N | R14E | 35,32 | | | I |
| Unnamed | San Bernardino | T16N | R13E | 14 | | | I |
| Unnamed | San Bernardino | T16N | R13E | 16 | | | I |
| Unnamed | San Bernardino | T16N | R13E | 17 | | | I |
| Unnamed | San Bernardino | T16N | R12E | 27 | | | I |
| Unnamed | San Bernardino | T16N | R12E | 27 | | | I |
| Unnamed | San Bernardino | T16N | R12E | 32/33 | | | I |
| Halloran Wash | San Bernardino | T15N | R11E | 14 | | | I |
| Unnamed | San Bernardino | T15N | R10E | 31 | | | I |
| Soda Lake | San Bernardino | T13N | R8E | 12,13,14 | | | I |
| Unnamed | San Bernardino | T13N | R8E | 22 | | | I |
| Unnamed | San Bernardino | T13N | R8E | 20 | | | I |
| Unnamed | San Bernardino | T13N | R8E | 20 | | | I |
| Unnamed | San Bernardino | T13N | R8E | 19 | | | I |
| Unnamed | San Bernardino | T13N | R8E | 19 | | | I |
| Unnamed | San Bernardino | T13N | R8E | 30 | | | I |
| Unnamed | San Bernardino | T13N | R7E | 36 | | | I |
| Unnamed | San Bernardino | T12N | R7E | 1 | | | I |
| Unnamed | San Bernardino | T12N | R7E | 11 | | | I |
| Unnamed | San Bernardino | T12N | R7E | 15 | | | I |
| Unnamed | San Bernardino | T12N | R7E | 21 | | | I |
| Unnamed | San Bernardino | T12N | R7E | 20 | | | I |
| Unnamed | San Bernardino | T12N | R7E | 19 | | | I |
| Unnamed | San Bernardino | T12N | R6E | 35 | | | I |
| Unnamed | San Bernardino | T12N | R6E | 34 | | | I |

Table D-1. RIVERS, CREEKS, AND DRAINAGES CROSSED BY THE PROJECT RIGHT-OF-WAY (concluded)

| Name | County | Township | Range | Section | Milepost | Approx. Width | Type[a] |
|---|---|---|---|---|---|---|---|
| CALIFORNIA (cont'd) | | | | | | | |
| Unnamed | San Bernardino | T12N | R6E | 33 | | | I |
| Unnamed | San Bernardino | T12N | R6E | 2 | | | I |
| Unnamed | San Bernardino | T12N | R6E | 11 | | | I |
| Unnamed | San Bernardino | T12N | R6E | 11 | | | I |
| Unnamed | San Bernardino | T11N | R5E | 15 | | | I |
| Unnamed | San Bernardino | T11N | R5E | 15 | | | I |
| Unnamed | San Bernardino | T11N | R5E | 29 | | | I |
| Unnamed | San Bernardino | T11N | R5E | 30 | | | I |
| Well Manix Wash | San Bernardino | T10N | R4E | 5 | | | I |

[a] I = Intermittent, P = Perennial

# APPENDIX E
# GEOLOGIC HAZARDS TABLE

---

Table E-1. GEOLOGIC HAZARDS

| Location | Topography | Geologic Units | Landslide Hazard |
|---|---|---|---|
| WYOMING | | | |
| Wyo./Colo. border (Laramie Co.) to Laramie (Albany Co.) | Moderate relief, south end, Laramie Range | Precambrian - Sherman Granite Carboniferous - Casper Frm. (Fossiliferous ls, ss, sh), Forelle ls, and Triassic-Chugwater Frm | Low <no slides mapped on route> Possible small local failure, isolated along steeper slopes. |
| Laramie (Albany Co.) to Rawlins (Carbon Co.) | Low to moderately low relief. Laramie and Hanna Basins, northern foothills of Medicine Bow Range, and the Rawlins Uplift | Tertiary sediments undif. (some Browns Park Frm), Cretaceous Mesa Verde Frm, and some Quaternary alluvium | Low <no slides mapped on route> |
| Rawlins (Carbon Co.) to Rock Springs (Sweetwater Co.) | Low to moderately low relief. Great Divide Basin, and Rock Springs Uplift | Tertiary sediments undif. (Battle Springs, Wasatch, Green River, Fort Union Frms.), Cretaceous sediments (Almond, Lance, Erickson ss, Rock Springs, and Blair Frms.) | Low <no slides mapped on route> Possible small local failure associated with easily eroded units |
| Rock Springs (Carbon Co.) to Utah/Wyo. border | Low to moderate relief. Green River Basin, and Bear River Divide | Tertiary sediments (Bridger, Wasatch, Green River, Fort Union, Browns Park Frms.), Cretaceous sediments (Frontier, and Bear River Frms.) | Low <no slides mapped on route> Possible small local failure, isolated along steeper slopes. |

Table E-1. GEOLOGIC HAZARDS (continued)

| Location | Topography | Geologic Units | Landslide Hazard |
|---|---|---|---|
| **UTAH/NEVADA** | | | |
| Utah/Wyo. border to Ogden, Utah (Summit, Rich, Morgan, Weber, and Davis Counties) | Moderate to high relief. Wasatch Mountains | Tertiary-Knight Conglomerate, Jurassic/Triassic sediments, Precambrian (crystalline gneiss, schist, and pegmatite) | Mod. to High <no slides mapped on route> Many slides on steep slopes adjacent to cable route. Wasatch Fault crossing. |
| Ogden to Salt Lake City (Davis Co., and Salt Lake Co.) | Flat to gently sloping. Wasatch Front and Great Salt Lake Basin | Various Quaternary alluvium | Low <no slides mapped on route> Possible failure on slopes parrallel to route, east of Wasatch fault zone. |
| Salt Lake City (Salt Lake Co.) to Ceder Fort (Utah Co.) | Flat to low relief. Basins and gently sloping fans | Various Quaternary alluvium Some Paleozoic frms. at the Traverse Mountains | Low <no slides mapped on route> Possible isolated failure on steeper slopes |
| Ceder Fort (Utah Co.) to Five Mile Pass (Tooele Co.) | Gently sloping to moderately low relief. Southern extent of the Oouirrh Mountains | Paleozoic frms. Some Quaternary alluvium. | Low <no slides mapped on route> Possible isolated failure on steeper slopes |
| Five Mile Pass (Tooele Co.) to Utah/Nev. border (Iron Co.) | Flat to moderate relief. Rush Valley, Tintic Valley, Sevier Desert, Escalante Desert, and Indian Peak Range | Various Quaternary alluvium. Some Triassic volcanics - Quichapa frm. | Low <no slides mapped on route> |
| Utah/Nevada border (Lincoln Co.) to Pahrangat Valley (Lincoln Co.) | Flat to moderate relief. Panace Hills, Delmar Mountains, South Pahroc Range, Meadow Valley, Pahroc Valley, and Six Mile Flat | Tertiary tuffaceous sediments, welded and non-welded silicic ashflow tuffs. Quaternary alluvium in basins. | Low <no slides mapped on route> Possible isolated failures on steep slopes |

Table E-1. GEOLOGIC HAZARDS (continued)

| Location | Topography | Geologic Units | Landslide Hazard |
|---|---|---|---|
| UTAH/NEVADA (cont'd) | | | |
| Pahrangat Valley (Lincoln Co.) to Arrow Canyon Range (Clark Co.) | Flat to moderately low relief. Pahrangat Valley, Evergreen Flat, and Hidden Valley | Various Quaternary alluvium and some Tertiary tuffaceous sediments. | Low <no slides mapped on route> |
| Arrow Canyon Range (Clark Co.) to Las Vegas (Clark Co.) | Low to moderately low relief. Arrow Canyon Range, Dry Lake Range, and Dry Lake Valley | Various Quaternary alluvium and some Pennsylvanian/Permian limestone, siltstone, sandstone and sparse dolomite. | Low <no slides mapped on route> |
| Las Vegas (Clark Co.) to Cal/Nevada border (Clark Co.) | Flat to gently sloping. Ivanpah Valley | Various Quaternary alluvium. Some local Tertiary-andesite and basalt flows | Low <no slides mapped on route> |
| CALIFORNIA (CalNev Route) | | | |
| California-Nevada border to Clark Mountains | Flat to gently sloping. Ivanpah Valley | Quaternary alluvium | Low. <no slides mapped on route> |
| Clark Mountains to Shadow Valley | Low to moderately low relief. Clark Mountains, south end | Quaternary alluvium | Low. <no slides mapped on route> |
| Shadow Valley to Baker | Flat to low relief. Halloran Wash. | Quaternary alluvium. Some Mesozoic granite | Low. <no slides mapped on route> |
| Baker to Cronese Valley | Flat to moderately low relief. North end, Soda Lake and Soda Mountains | Quaternary alluvium. Tertiaryandesitic volcanics. Mesozoic granite | Low. <no slides mapped on route> |
| Cronese Valley to Dunn | Flat to gently sloping. Cronese Valley and Cronese Mountains | Quaternary alluvium. Tertiary andesitic volcanics. Mesozoic granite | Low. <no slides mapped on route> |

Table E-1. GEOLOGIC HAZARDS (continued)

| Location | Topography | Geologic Units | Landslide Hazard |
|---|---|---|---|
| CALIFORNIA (CalNev Route) (cont'd) | | | |
| Dunn to Marine Corps Supply Center (Yermo Area) | Flat to gently sloping | Quaternary alluvium. Some upper Miocene nonmarine sediments and Jurassic/ Triassic metavolcanic rocks | Low. <no slides mapped on route> |
| Marine Corps Supply Center (Yermo Area) to Barstow | Low to moderately low relief | Middle Miocene nonmarine Quaternary alluvium | Low. <no slides mapped on route> |
| Barstow to Brisbane Valley | Flat to gently sloping | Quaternary alluvium, Miocene granites | Low. <no slides mapped on route> |
| Brisbane Valley to George A.F. Base | Low to moderately low relief | Miocene granites, Jurassic/ Triassic metavolcanics, Carboniferous Undivided marine sediments, and Quaternary alluvium | Low. <no slides mapped on route> |
| George A.F. Base to Canjon Jct. | Flat to gently sloping. Baldy Mesa | Quaternary alluvium | Low. <no slides mapped on route> |
| CALIFORNIA (IPP Route) | | | |
| California-Nevada border to Clark Mountains | Gently sloping to moderately low relief | Quaternary alluvium, Pennsylvanian limestone | Low. <no active slides mapped on route> |
| Clark Mountains to Shadow Valley | Low to moderate relief. Clark Mountains | Quaternary alluvium, Pre-cambrian metamorphic rocks | Low. <no active slides mapped on route.> Possible isolated slides on steep slopes |
| Shadow Valley to Shadow Mountains | Flat to gently sloping. Shadow Valley | Quaternary alluvium | Low. <no active slides mapped on route> |

Table E-1. GEOLOGIC HAZARDS (continued)

| Location | Topography | Geologic Units | Landslide Hazard |
|---|---|---|---|
| CALIFORNIA (IPP Route) (cont'd) | | | |
| Shadow Mountains to Silver Lake Power Station | Low to moderately low relief. Shadow Mountains | Tertiary nonmarine sediments, Mesozoic granitic rocks, some Quaternary alluvium | Low. <no active slides mapped on route> |
| Silver Lake Power Station to Red Pass Lake | Flat to moderately low relief. North end, Soda Mountains | Quaternary alluvium, Mesozoic granitic rocks Jurassic/Triassic metavolcanic rocks, Upper Miocene nonmarine sediments, Miocene basalt | Low. <no active slides mapped on route> |
| Red Pass Lake to Alford Mountain | Flat to low relief | Quaternary alluvium, Mesozoic granitic rocks Jurassic/Triassic metavolcanic rocks, Upper Miocene nonmarine sediments, Miocene basalt | Low. <no active slides mapped on route.> Possible local failure in adverse formations |
| Alford Mountain to Daggett | Flat to gently sloping. Mojave Valley | Quaternary alluvium | Low. <no active slides mapped on route> |
| Daggett to Stoddard Valley | Gently sloping to moderately low relief. Stoddard Valley | Quaternary alluvium, Jurassic/Triassic metavolcanic rocks, Miocene undivided nonmarine sediments | Low. <no active slides mapped on route> |
| Stoddard Valley to Apple Valley | Flat to moderate relief, Stoddard Ridge and Sidewinder Valley | Miocene granite, Jurassic/Triassic metavolcanic rocks, some Quaternary alluvium | Low. <no active slides mapped on route.> Possible isolated failure on steep slopes. |
| Apple Valley to Cajon Jct. | Flat to gently sloping. Apple Valley | Quaternary alluvium, Pliocene undivided nonmarine sediments | Low. <no active slides mapped on route> |

Table E-1. GEOLOGIC HAZARDS (concluded)

| Location | Topography | Geologic Units | Landslide Hazard |
|---|---|---|---|
| CALIFORNIA | | | |
| Cajon Jct. to Devore | Low to moderate relief. San Bernadino Mountains, Cajon Pass, Cajon Canyon, San Andreas Fault trace | Mesozoic schist and granite, Precambrian igneous meta-morphic rock complex, some Quaternary alluvium | Moderate <no active slides mapped on route.> Many active slides on slopes adjacent to route. San Andreas Fault Zone crossing |
| Devore to San Bernardino | Flat to gently sloping. San Bernardino Valley | Quaternary alluvium | Low. <no active slides mapped on route> |
| Devore to Gillman Airport | Flat to low relief. San Bernardino Valley | Quaternarly alluvium Mesozoic granite | Low. <no active slides mapped on route.> Possible isolated failures on steep slopes |
| San Bernardino/Gillman Airport to Cucamonga | Flat to gently sloping | Quaternary alluvium | Low. <no active slides mapped on route> |
| Cucamonga to San Dimas | Flat to low relief | Quaternary alluvium some Mesozoic granite | Low. <no active slides mapped on route> |
| San Dimas to East L.A. | Flat to gently sloping | Quaternary alluvium | Low. <no active slides mapped on route> |

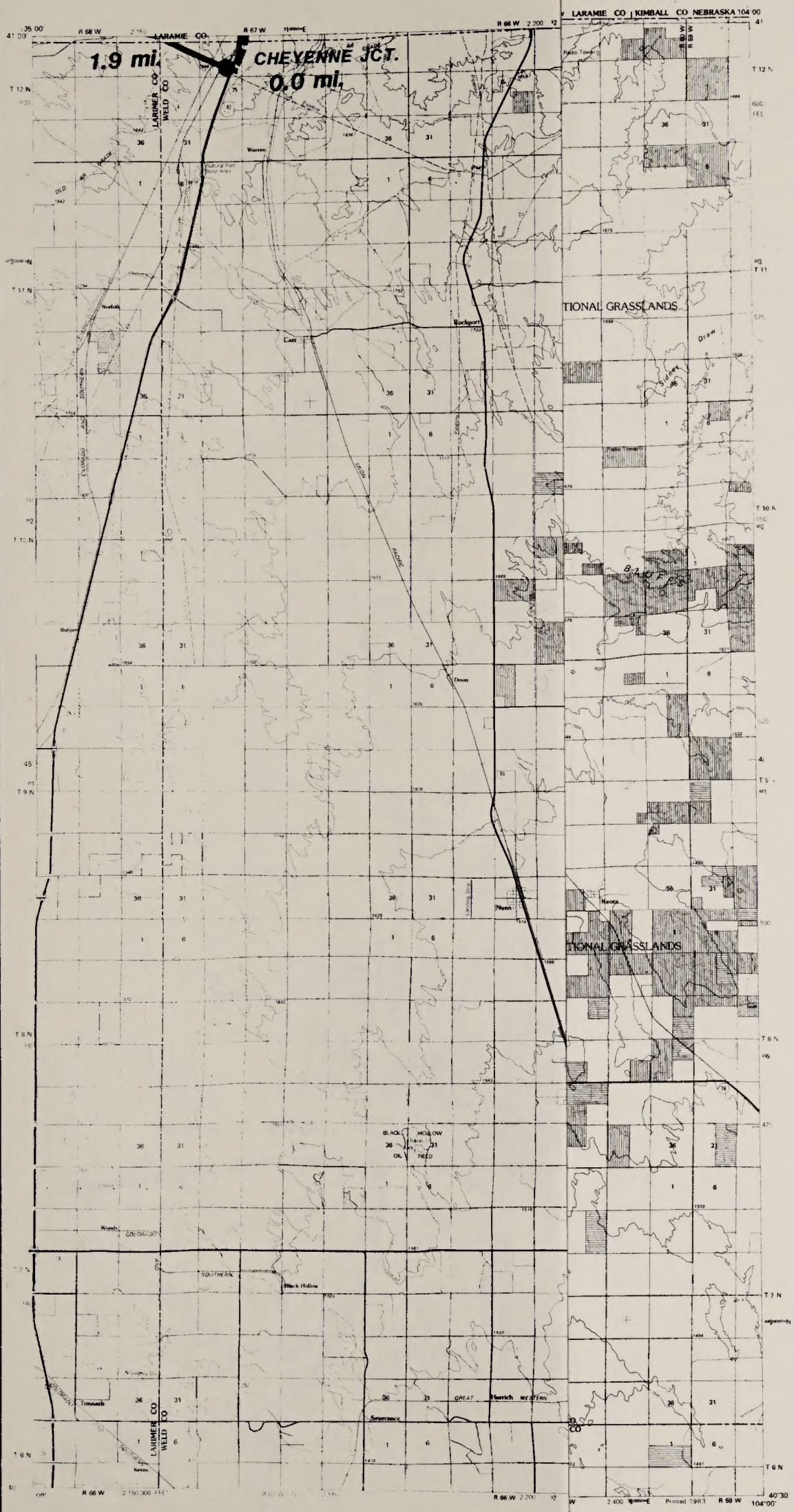
# APPENDIX F
# PROJECT ROUTE MAPS

# -WILTEL-
# Fiber Optic Cable Right-of-Way
## Environmental Assessment

Project Route Map

Sheet 1 of 34

EATON, CO

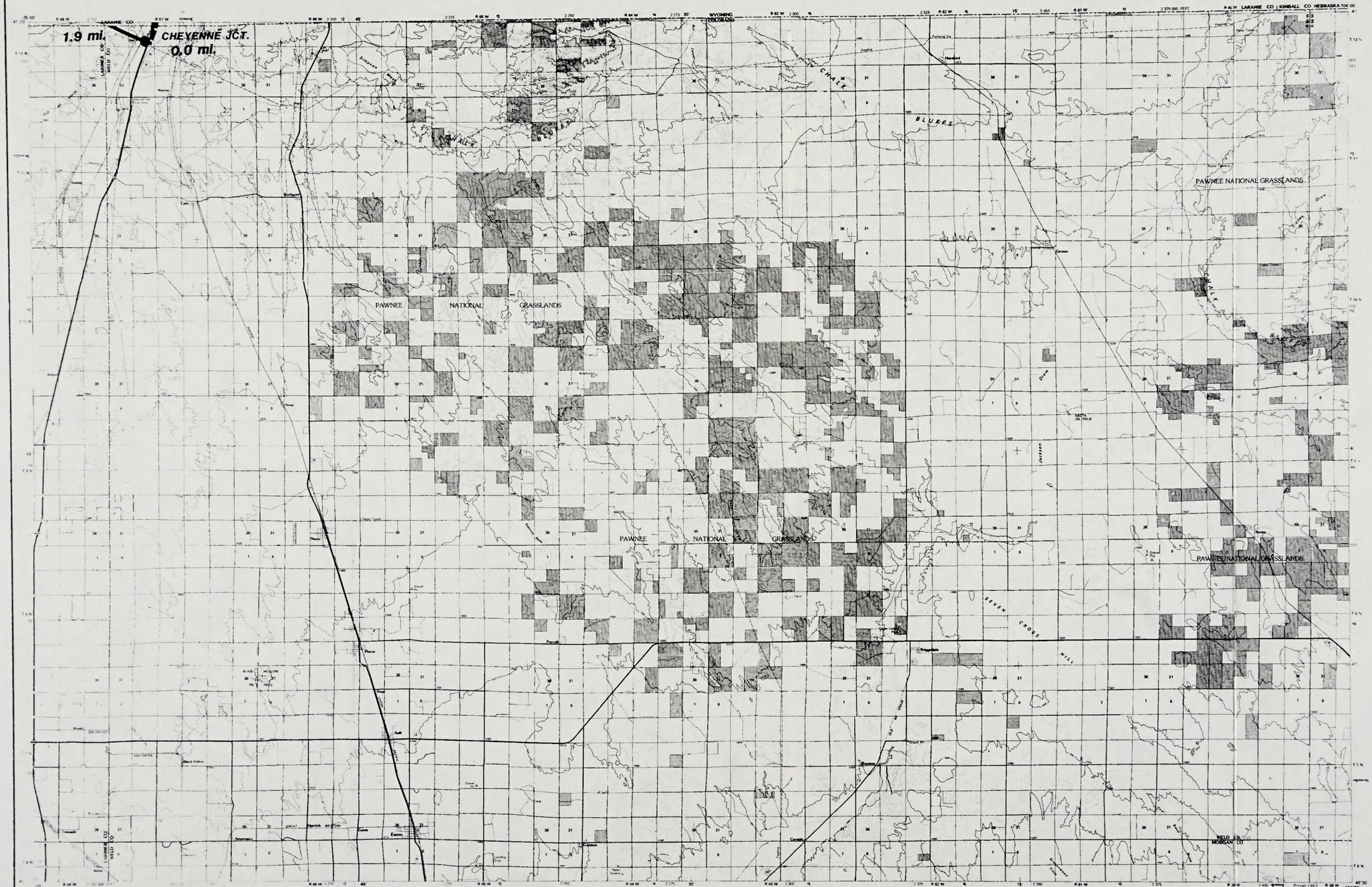



REGENERATOR LOCATIONS

# -WILTEL-
# Fiber Optic Cable Right-of-Way
## Environmental Assessment

Project Route Map
Sheet 1 of 34

EATON, CO




SCALE
1 0 1 2 3 4 5 miles

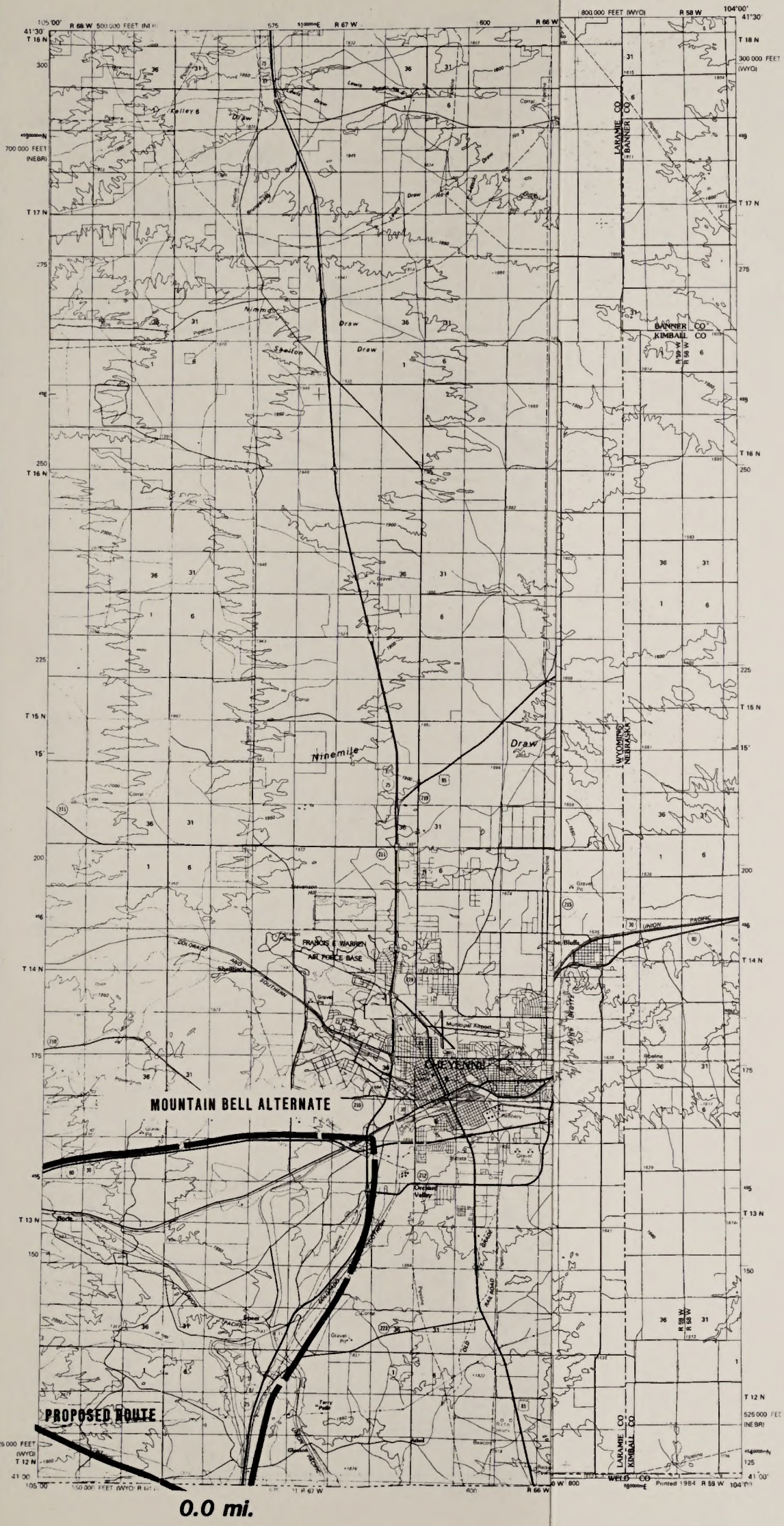
REGENERATOR LOCATIONS

# -WILTEL-
# Fiber Optic Cable Right-of-Way
## Environmental Assessment

Project Route Map

Sheet 2 of 34

CHEYENNE, WY




REGENERATOR LOCATIONS

MOUNTAIN BELL REGENERATOR SITE

# -WILTEL-
# Fiber Optic Cable Right-of-Way
## Environmental Assessment

Project Route Map
Sheet 2 of 34

CHEYENNE, WY

MOUNTAIN BELL ALTERNATE

PROPOSED ROUTE

0.0 mi.

REGENERATOR LOCATIONS

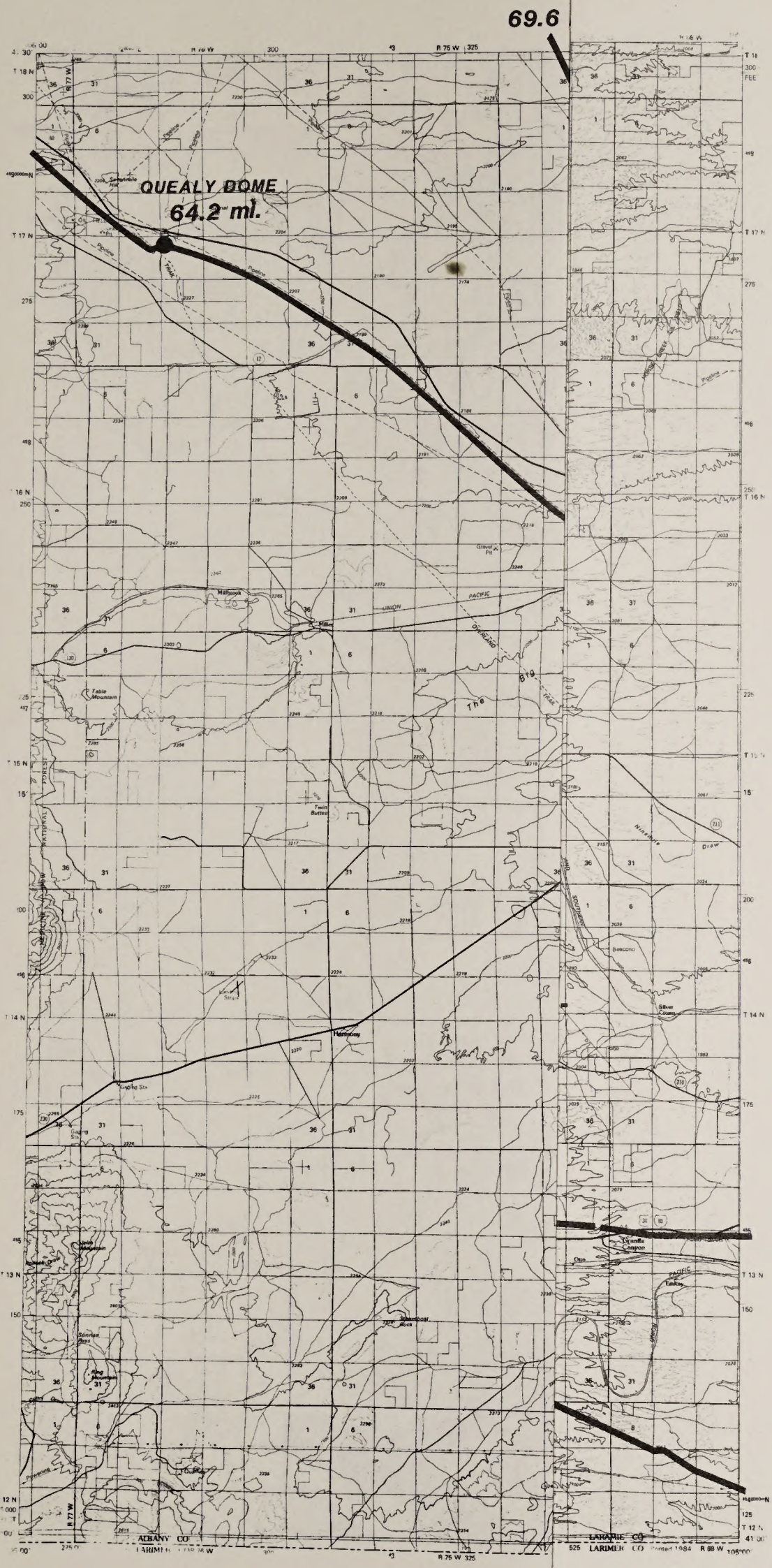
MOUNTAIN BELL REGENERATOR SITE

SCALE
1 0 1 2 3 4 5 miles

# -WILTEL-
# Fiber Optic Cable Right-of-Way
## Environmental Assessment

Project Route Map

Sheet 3 of 34




LARAMIE, WY

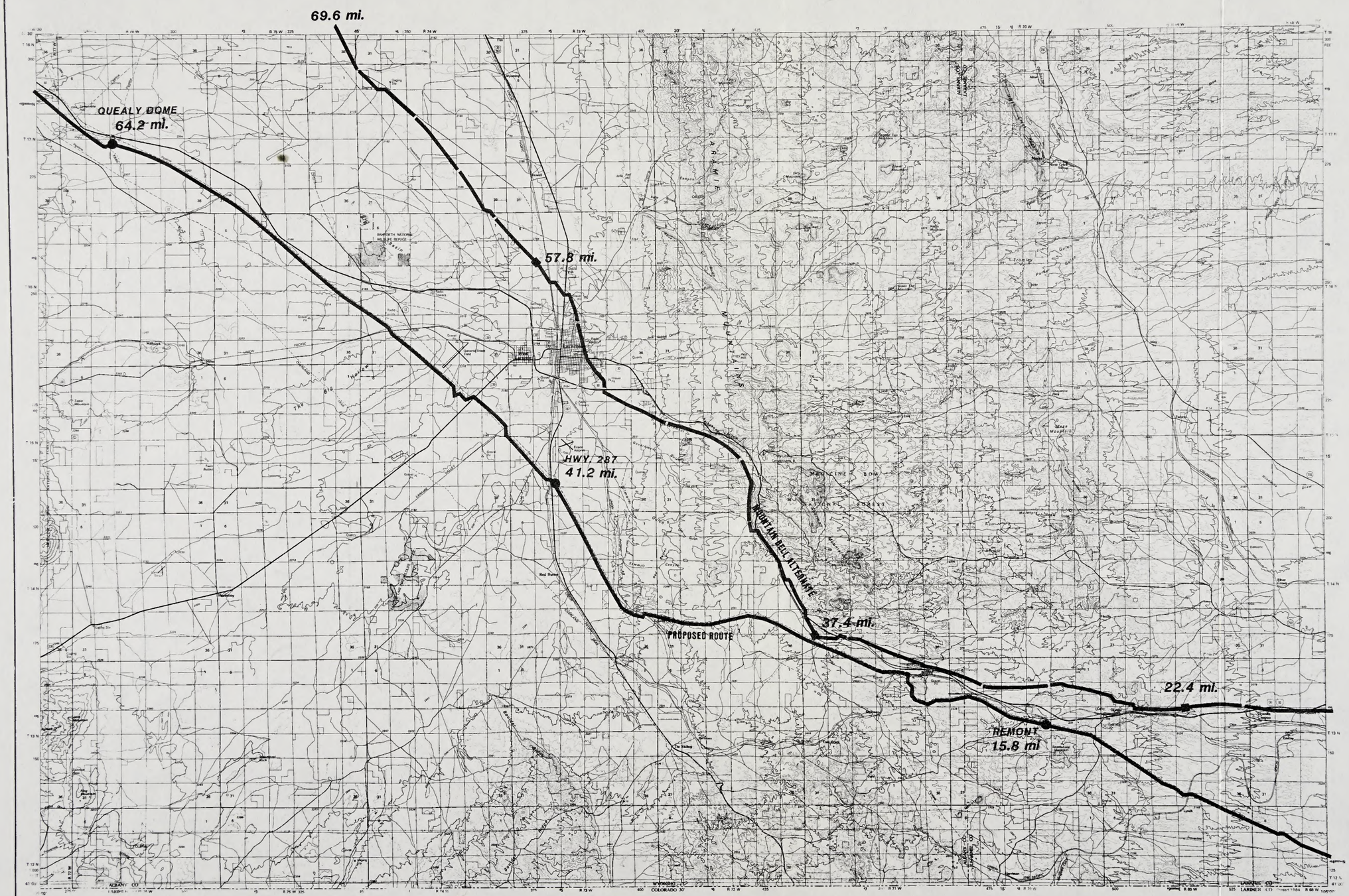
REGENERATOR LOCATIONS

MOUNTAIN BELL REGENERATOR SITE

# -WILTEL-
# Fiber Optic Cable Right-of-Way
## Environmental Assessment

Project Route Map
Sheet 3 of 34

LARAMIE, WY



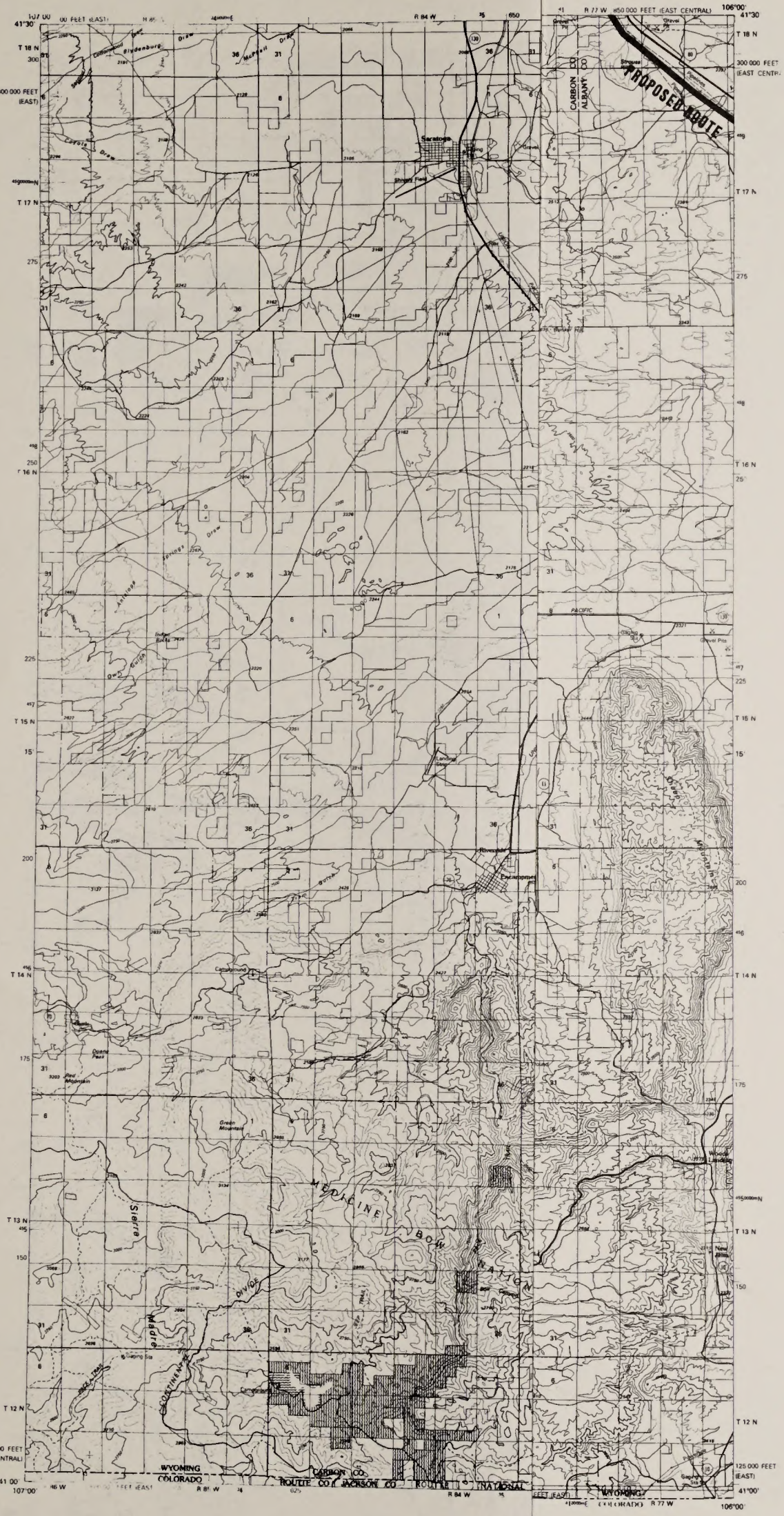

SCALE
1 0 1 2 3 4 5 miles

REGENERATOR LOCATIONS
MOUNTAIN BELL REGENERATOR SITE

# -WILTEL-
# Fiber Optic Cable Right-of-Way
## Environmental Assessment

Project Route Map
Sheet 4 of 34

SARATOGA, WY



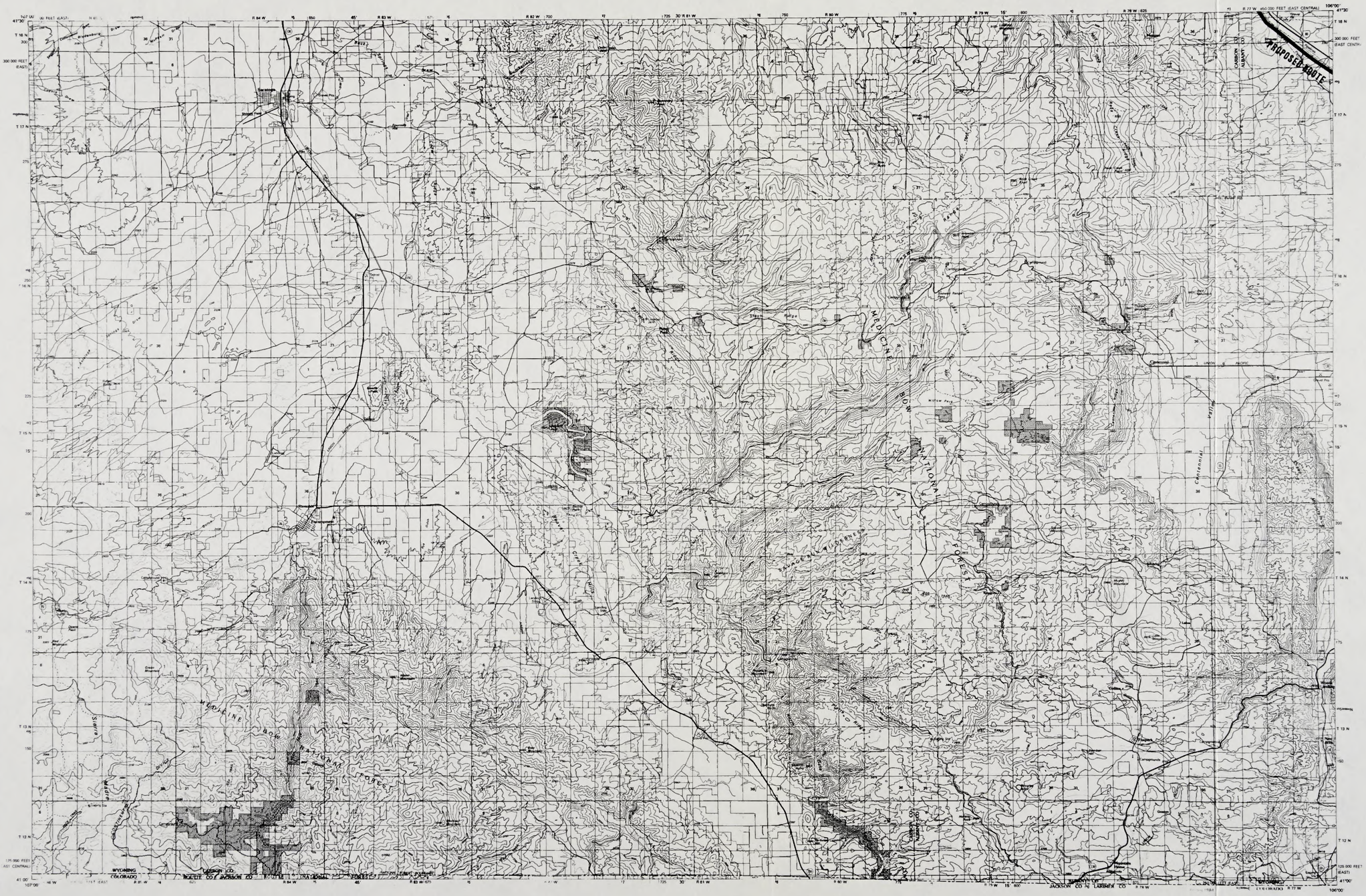

REGENERATOR LOCATIONS

**-WILTEL-**
**Fiber Optic Cable**
**Right-of-Way**

**Environmental Assessment**

**Project Route Map**
**Sheet 4 of 34**

SARATOGA, WY



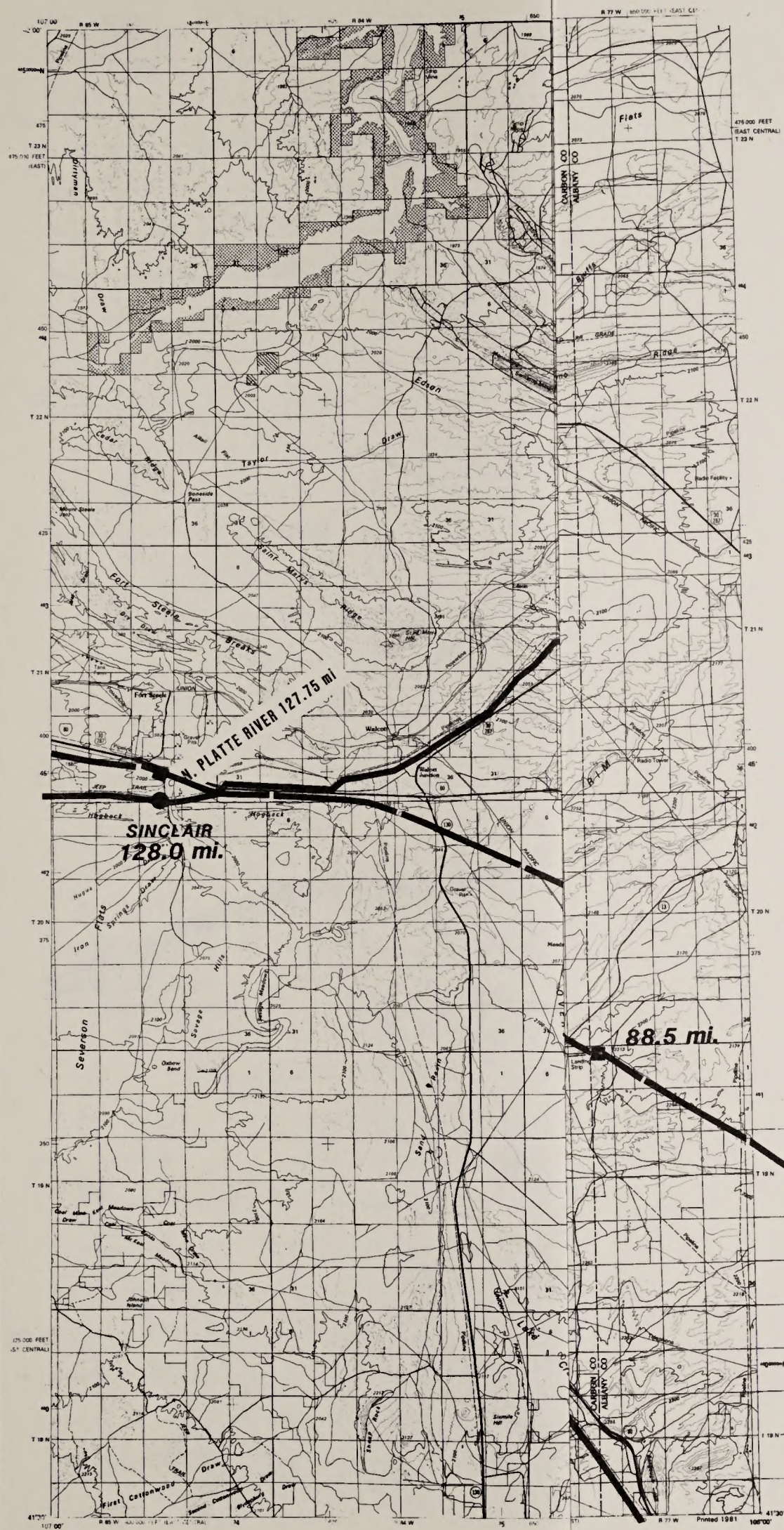

SCALE
1 0 1 2 3 4 5 miles

REGENERATOR LOCATIONS

# -WILTEL-
# Fiber Optic Cable Right-of-Way
## Environmental Assessment

Project Route Map
Sheet 5 of 34

MEDICINE BOW, WY



-WILTEL-
Fiber Optic Cable
Right-of-Way

**Environmental Assessment**

Project Route Map
Sheet 5 of 34

MEDICINE BOW, WY

EDSON
114.2 mi.

PROPOSED ROUTE

PLATTE RIVER 127.75 mi

SINCLAIR
128.0 mi.

122.6 mi.

106.7 mi.

MOUNTAIN BELL ALTERNATE

88.5 mi.

ARLINGTON
82.9 mi.

REGENERATOR LOCATIONS

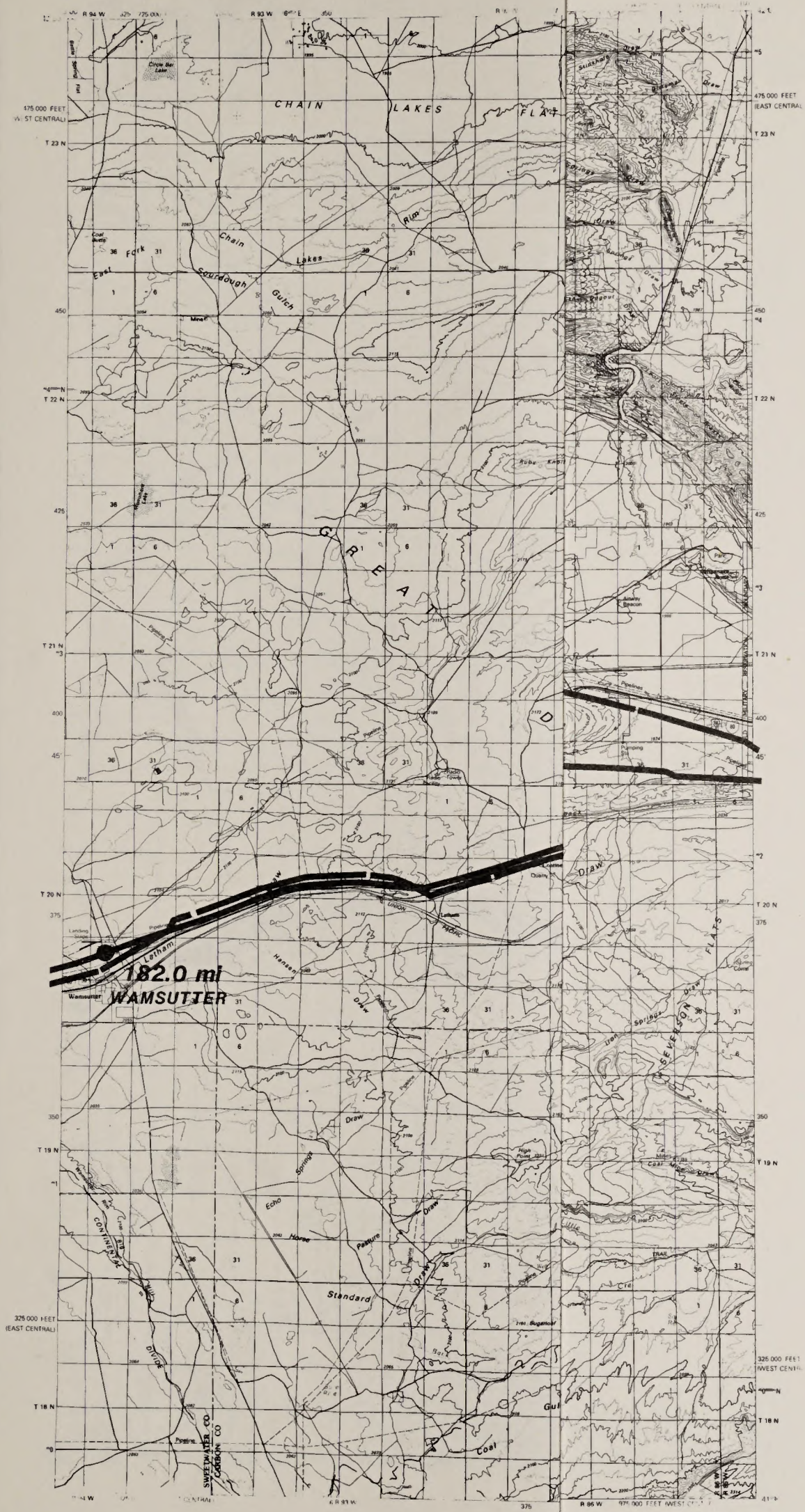
MOUNTAIN BELL REGENERATOR SITE

SCALE
1 0 1 2 3 4 5 miles

# -WILTEL-
# Fiber Optic Cable Right-of-Way
## Environmental Assessment

Project Route Map
Sheet 6 of 34

RAWLINS, WY




REGENERATOR LOCATIONS

MOUNTAIN BELL REGENERATOR SITE

**-WILTEL-**
**Fiber Optic Cable Right-of-Way**
**Environmental Assessment**

Project Route Map
Sheet 6 of 34

RAWLINS, WY

169.3 mi.

MOUNTAIN BELL ALTERNATE

PROPOSED ROUTE

145.0 mi.

RIVER
159.2 mi.

182.0 mi
WAMSUTTER

REGENERATOR LOCATIONS
MOUNTAIN BELL REGENERATOR SITE

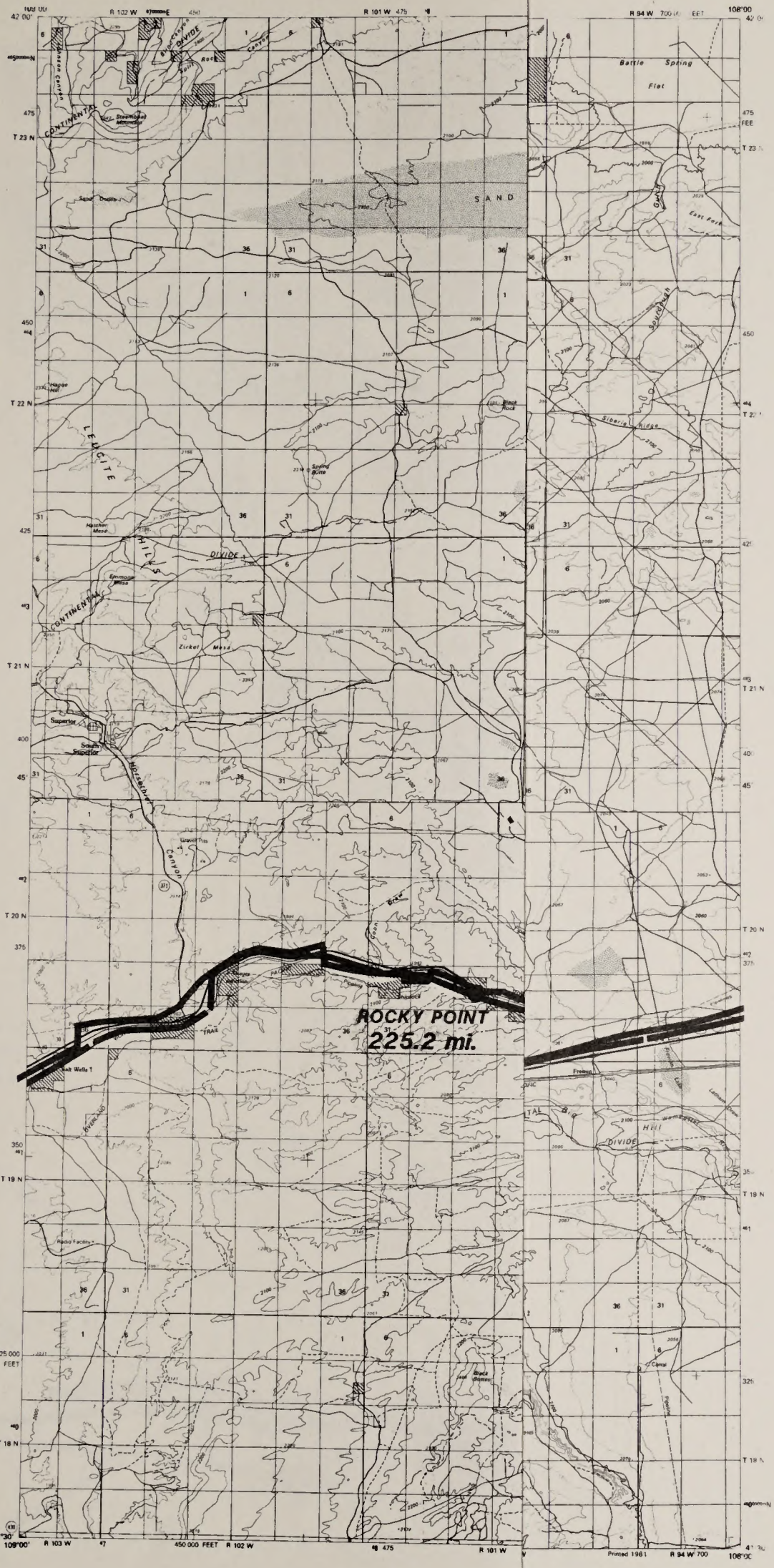
SCALE 1:100 000

SCALE
1 0 1 2 3 4 5 miles

# -WILTEL-
# Fiber Optic Cable Right-of-Way
## Environmental Assessment

Project Route Map
Sheet 7of34

RED DESERT
BASIN, WY



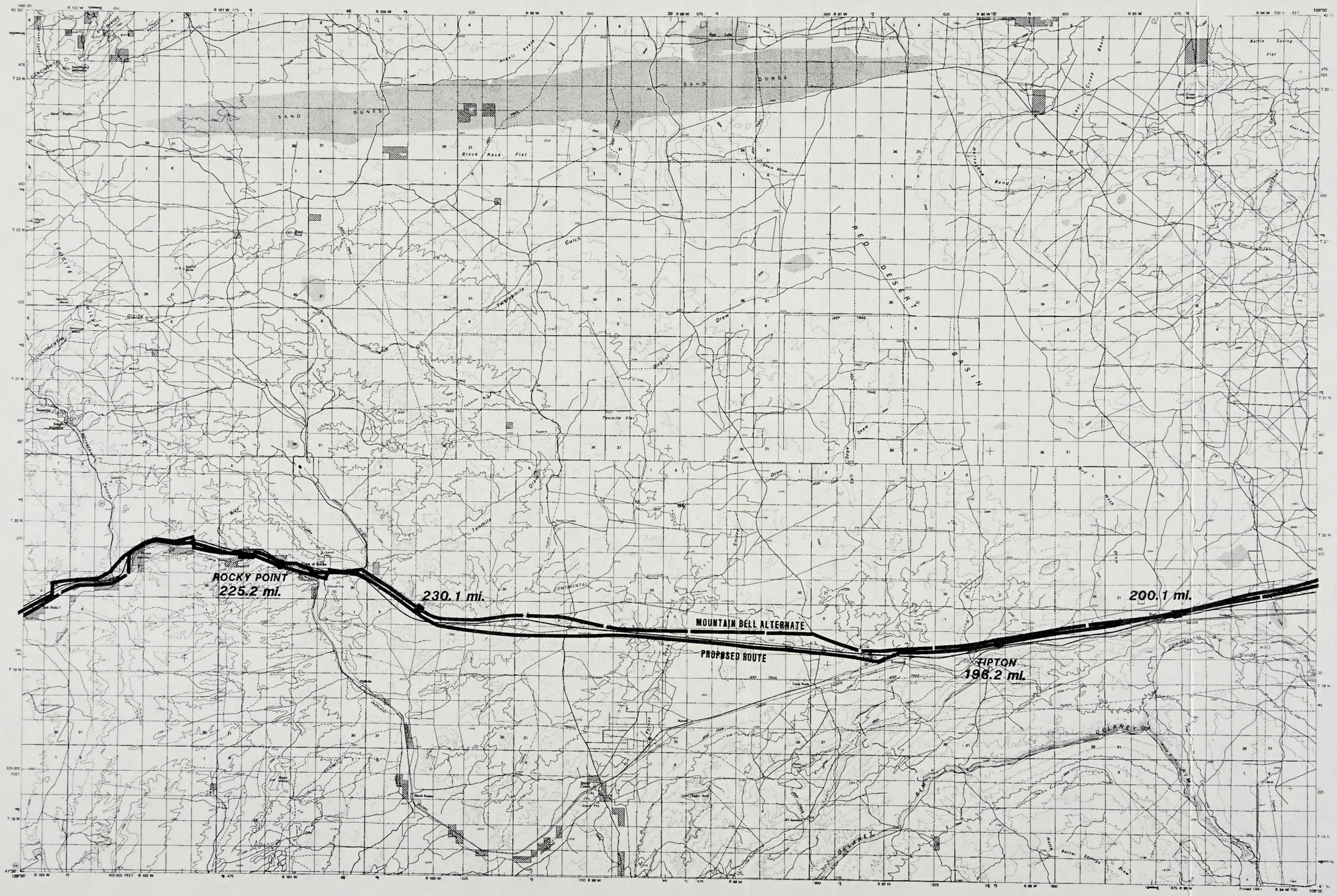

REGENERATOR LOCATIONS

MOUNTAIN BELL REGENERATOR SITE

# -WILTEL-
# Fiber Optic Cable Right-of-Way
## Environmental Assessment

Project Route Map
Sheet 7 of 34

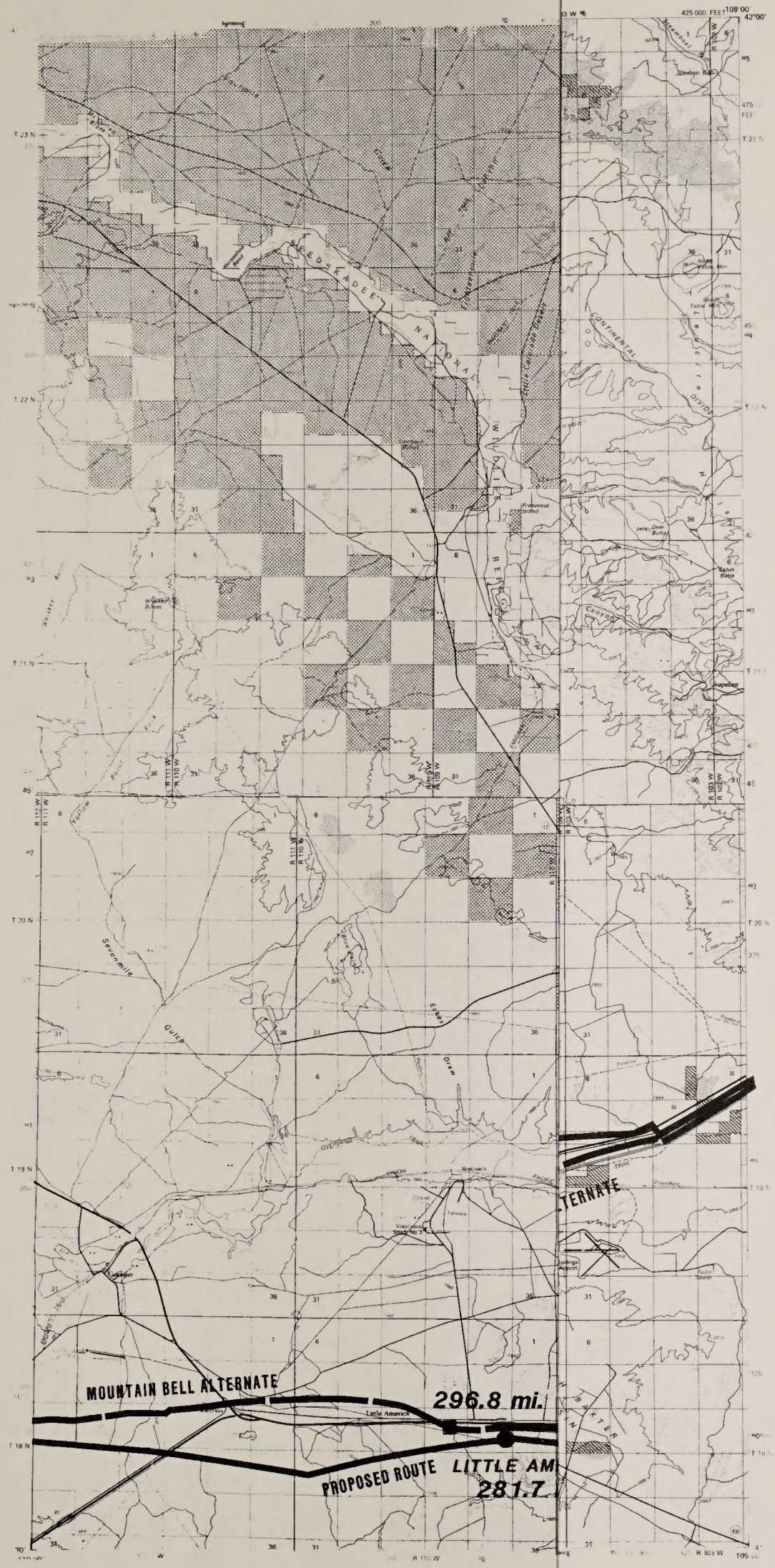
RED DESERT
BASIN, WY


ROCKY POINT
225.2 mi.
230.1 mi.
MOUNTAIN BELL ALTERNATE
PROPOSED ROUTE
200.1 mi.
TIPTON
196.2 mi.
RED DESERT BASIN
SAND DUNES
SAND DUNES
CONTINENTAL DIVIDE
Tenmile Flat
Dugout Draw
Black Rock Flat
Battle Spring Flat
Table Rock
Rat Lake
Alkali Basin
Hurricane Bench
Quaker Draw
Fort Creek
Bear
Creek
Gulch
Tenmile
Draw
Dugout
Draw
Table Rock
Draw
Spring
Draw
Alkali
Draw
Spring
Draw
Fort
Creek
Bear
Creek
Battle
Spring
Flat
Hurricane
Bench
Quaker
Draw
Fort
Creek
Bear
Creek
Gulch
Tenmile
Draw
Dugout
Draw
Tenmile
Flat
Table
Rock
Draw
Spring
Draw
Alkali
Draw
Spring
Draw
Fort
Creek
Bear
Creek
Battle
Spring
Flat
Table Rock
Flat
Black
Rock

# -WILTEL-
# Fiber Optic Cable Right-of-Way
## Environmental Assessment

Project Route Map
Sheet 8 of 34

ROCK SPRINGS, WY



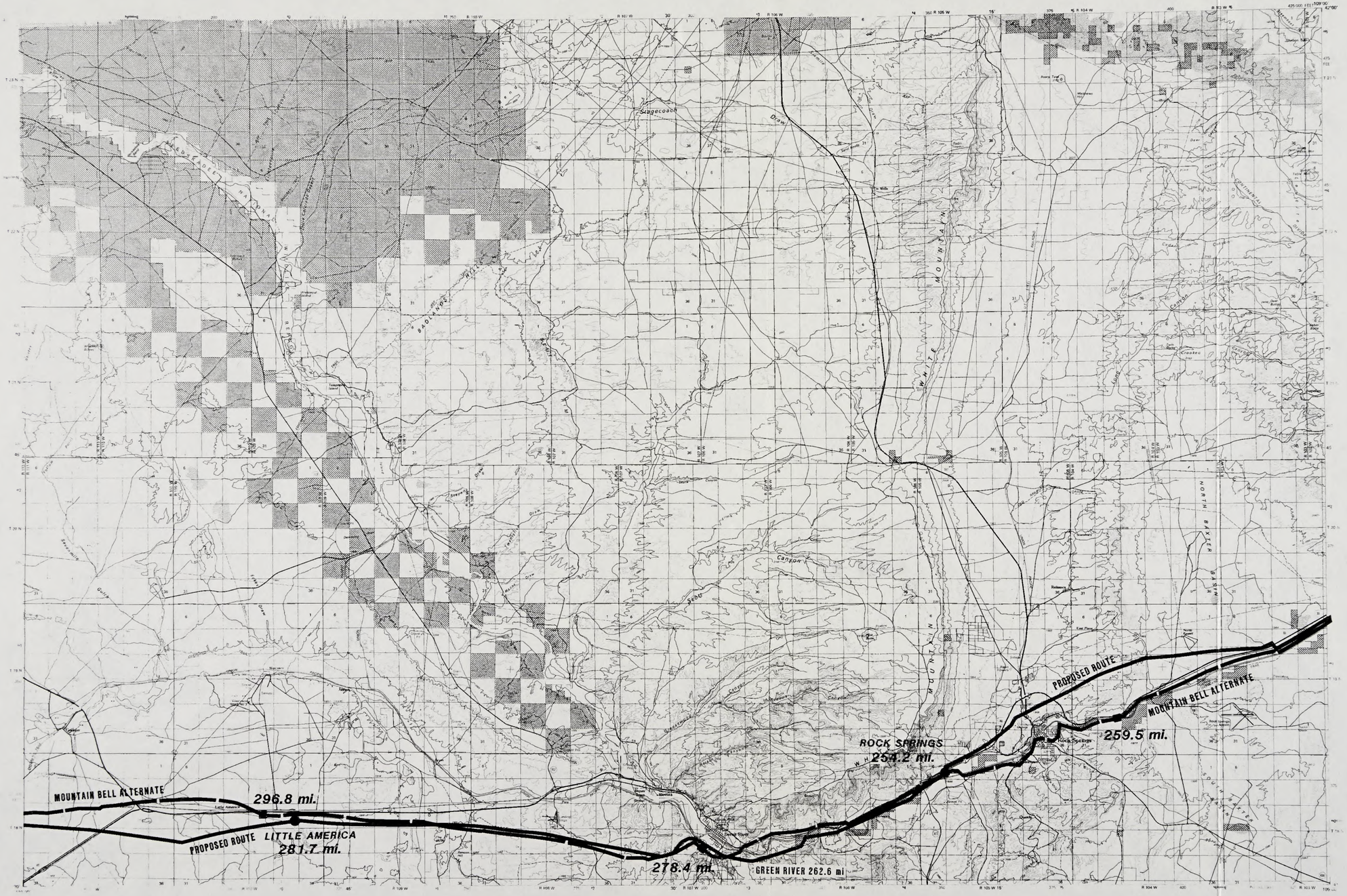

REGENERATOR LOCATIONS

MOUNTAIN BELL REGENERATOR SITE

# -WILTEL-
# Fiber Optic Cable Right-of-Way
## Environmental Assessment

Project Route Map
Sheet 8 of 34

ROCK SPRINGS, WY

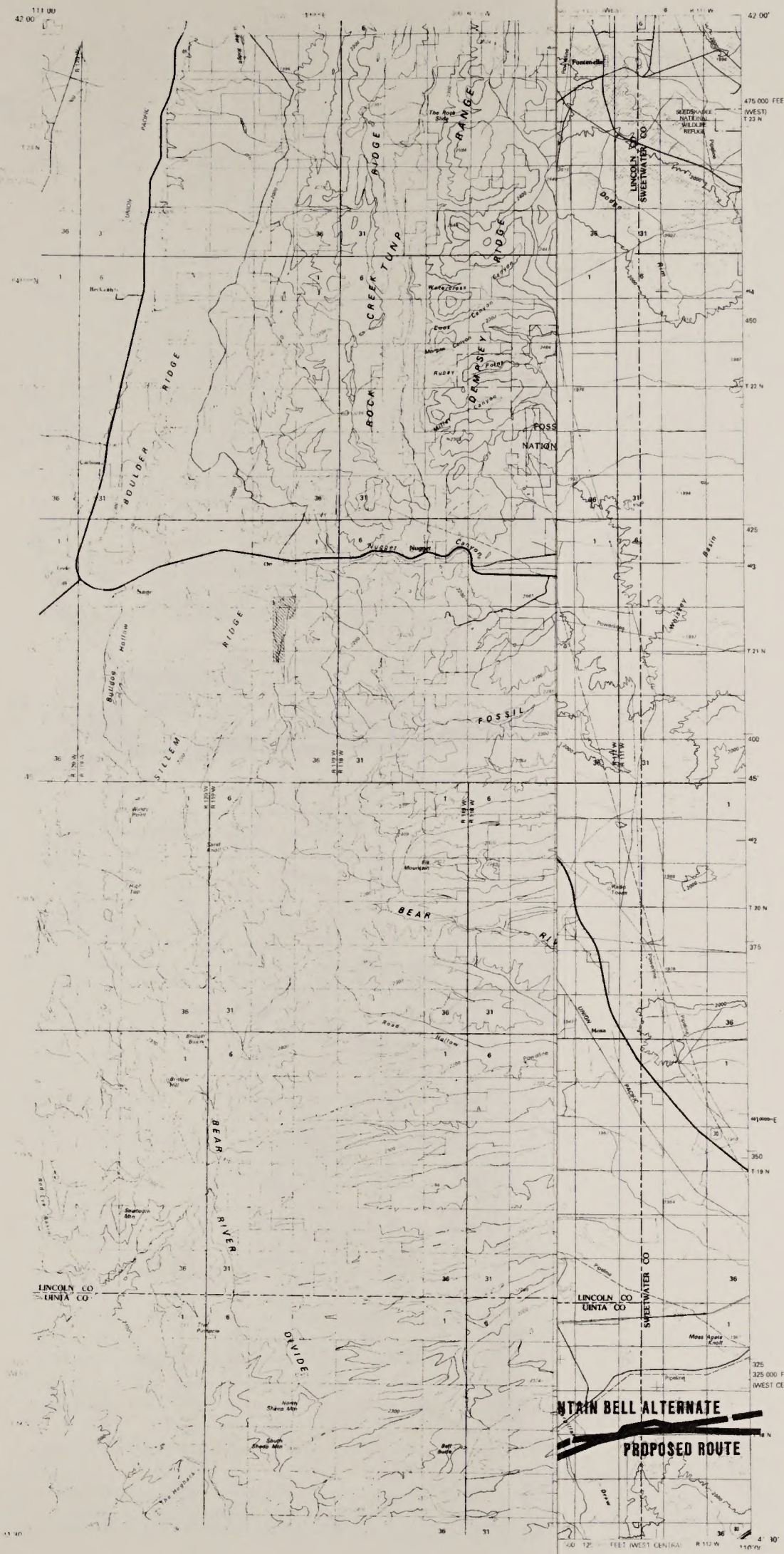

Sugarcoach
Dana
Seminoe
Creek
Canyon
Creek
Canyon
Creek
Canyon

# -WILTEL-
# Fiber Optic Cable Right-of-Way
## Environmental Assessment

Project Route Map

Sheet 9 of 34

KEMMERER, WY



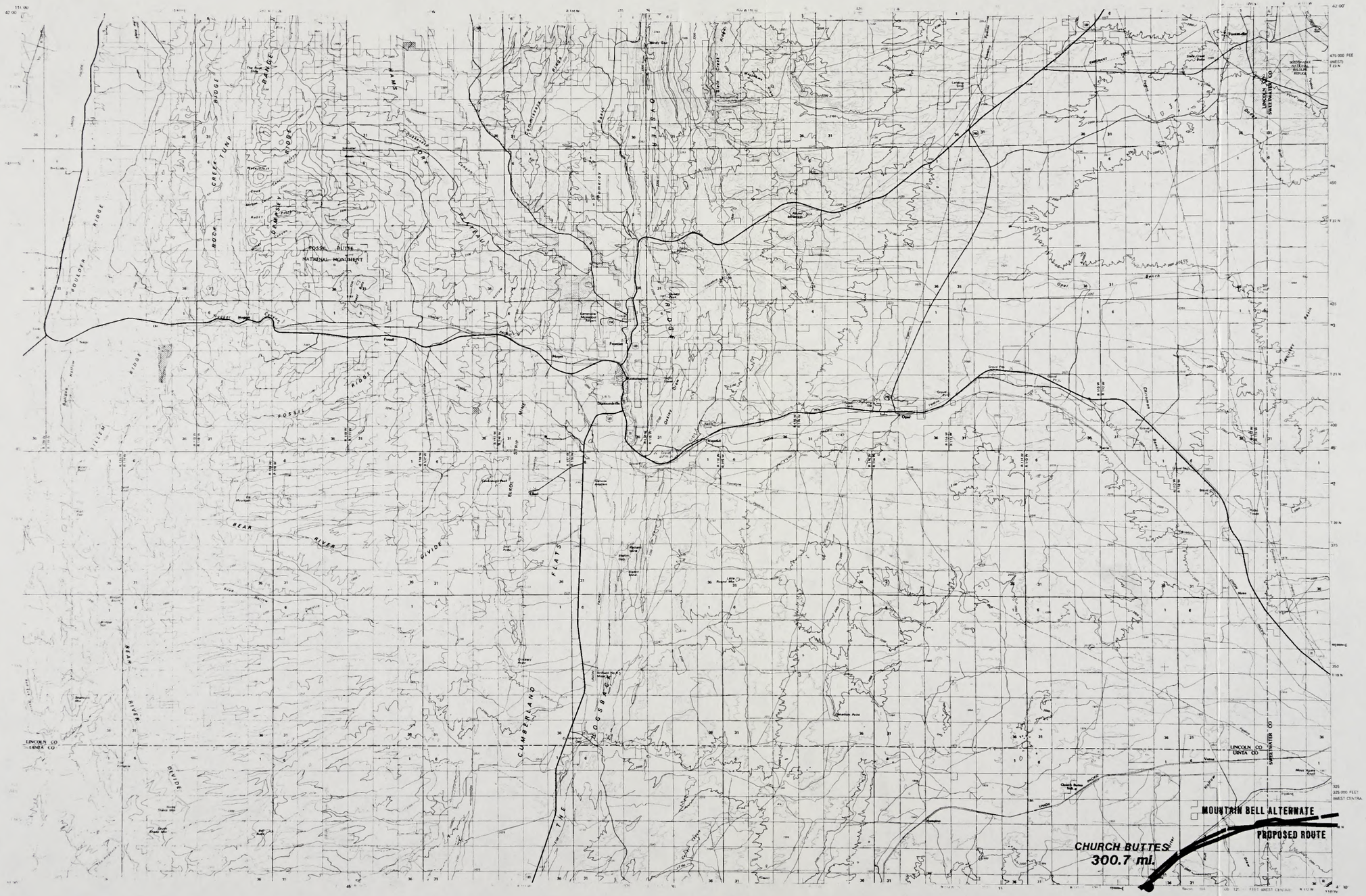

REGENERATOR LOCATIONS

**-WILTEL-**
**Fiber Optic Cable**
**Right-of-Way**

**Environmental Assessment**

Project Route Map
Sheet 9 of 34

KEMMERER, WY




REGENERATOR LOCATIONS

SCALE
1 0 1 2 3 4 5 miles

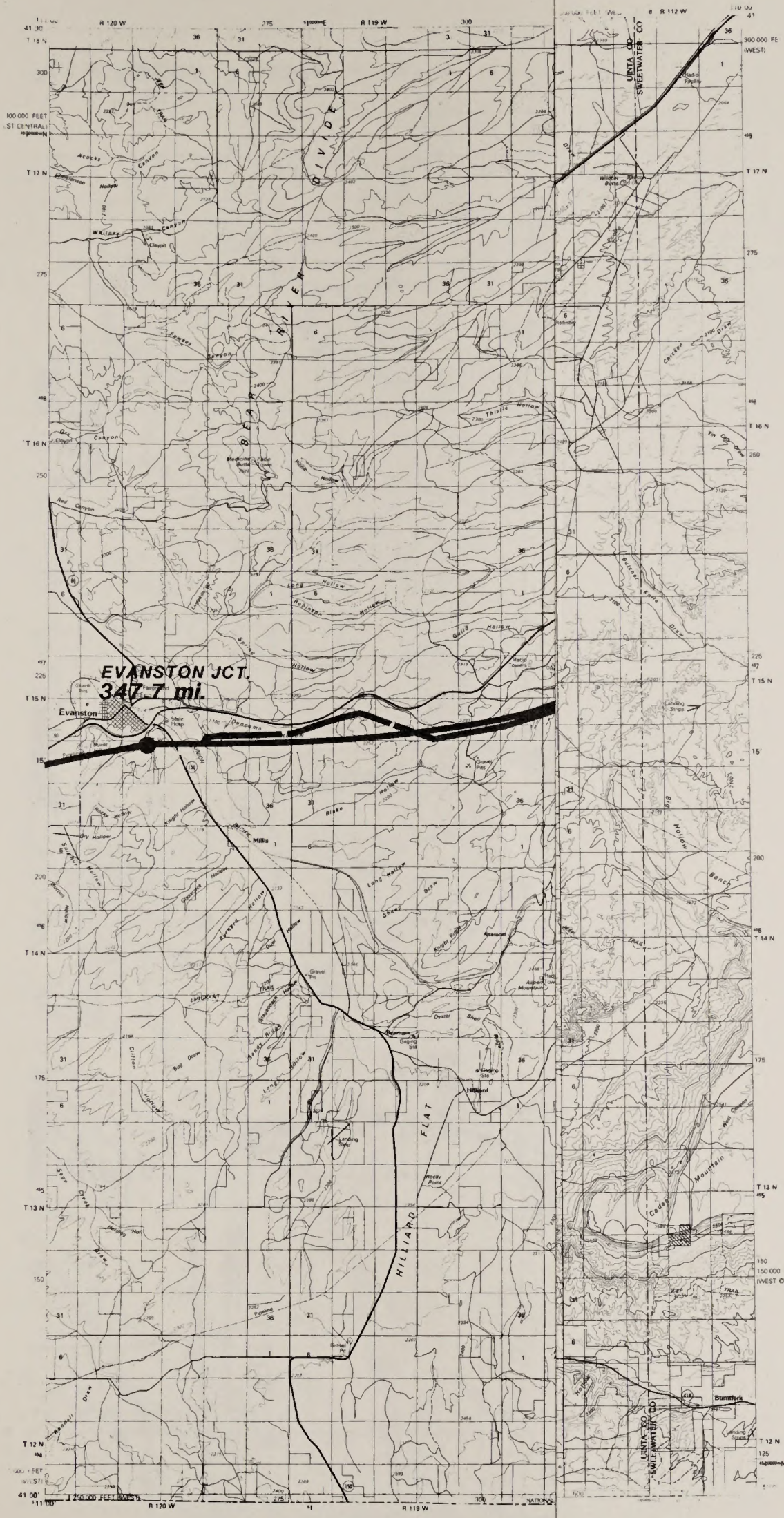
# -WILTEL-
# Fiber Optic Cable Right-of-Way

## Environmental Assessment

Project Route Map

Sheet 10 of 34

EVANSTON, WY




REGENERATOR LOCATIONS

MOUNTAIN BELL REGENERATOR SITE

# -WILTEL-
## Fiber Optic Cable Right-of-Way
## Environmental Assessment

Project Route Map
Sheet 10 of 34

EVANSTON, WY

REGENERATOR LOCATIONS

MOUNTAIN BELL REGENERATOR SITE

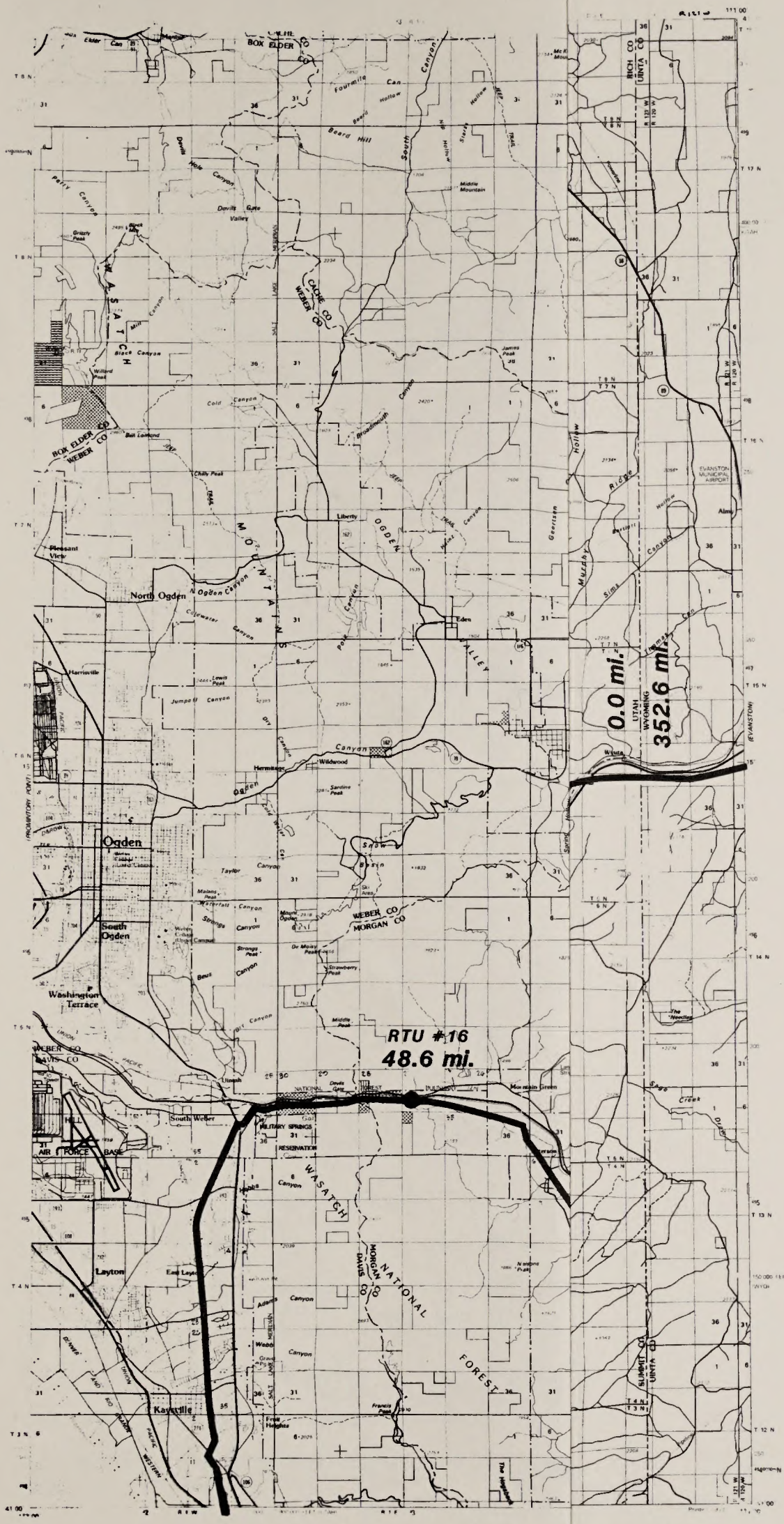
SCALE

1 0 1 2 3 4 5 miles

# -WILTEL-
# Fiber Optic Cable Right-of-Way
## Environmental Assessment

Project Route Map
Sheet 11 of 34

OGDEN, UT



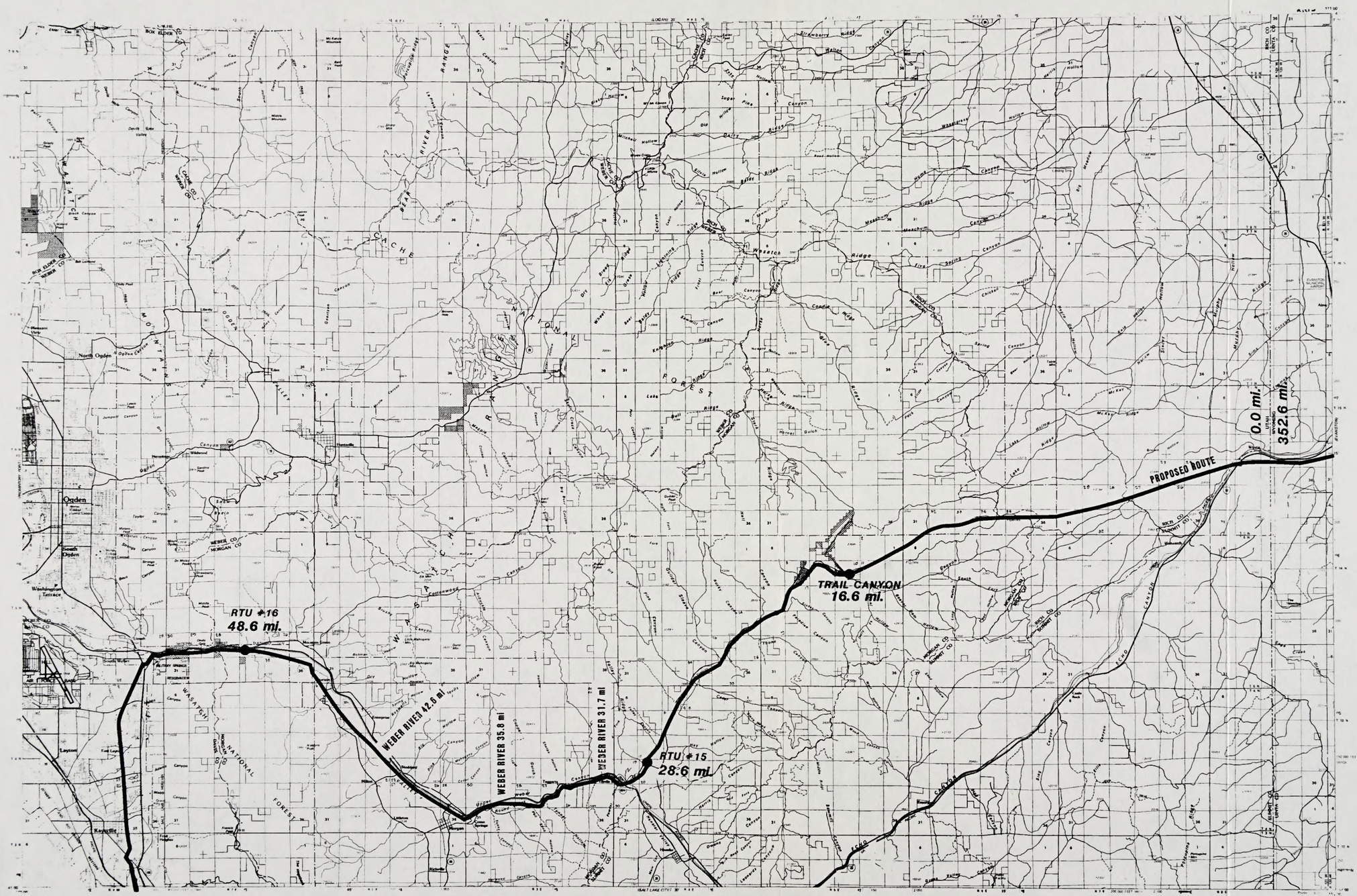

REGENERATOR LOCATIONS

**-WILTEL-**
**Fiber Optic Cable**
**Right-of-Way**

**Environmental Assessment**

Project Route Map
Sheet 11 of 34

OGDEN, UT




REGENERATOR LOCATIONS

SCALE
1 0 1 2 3 4 5 miles

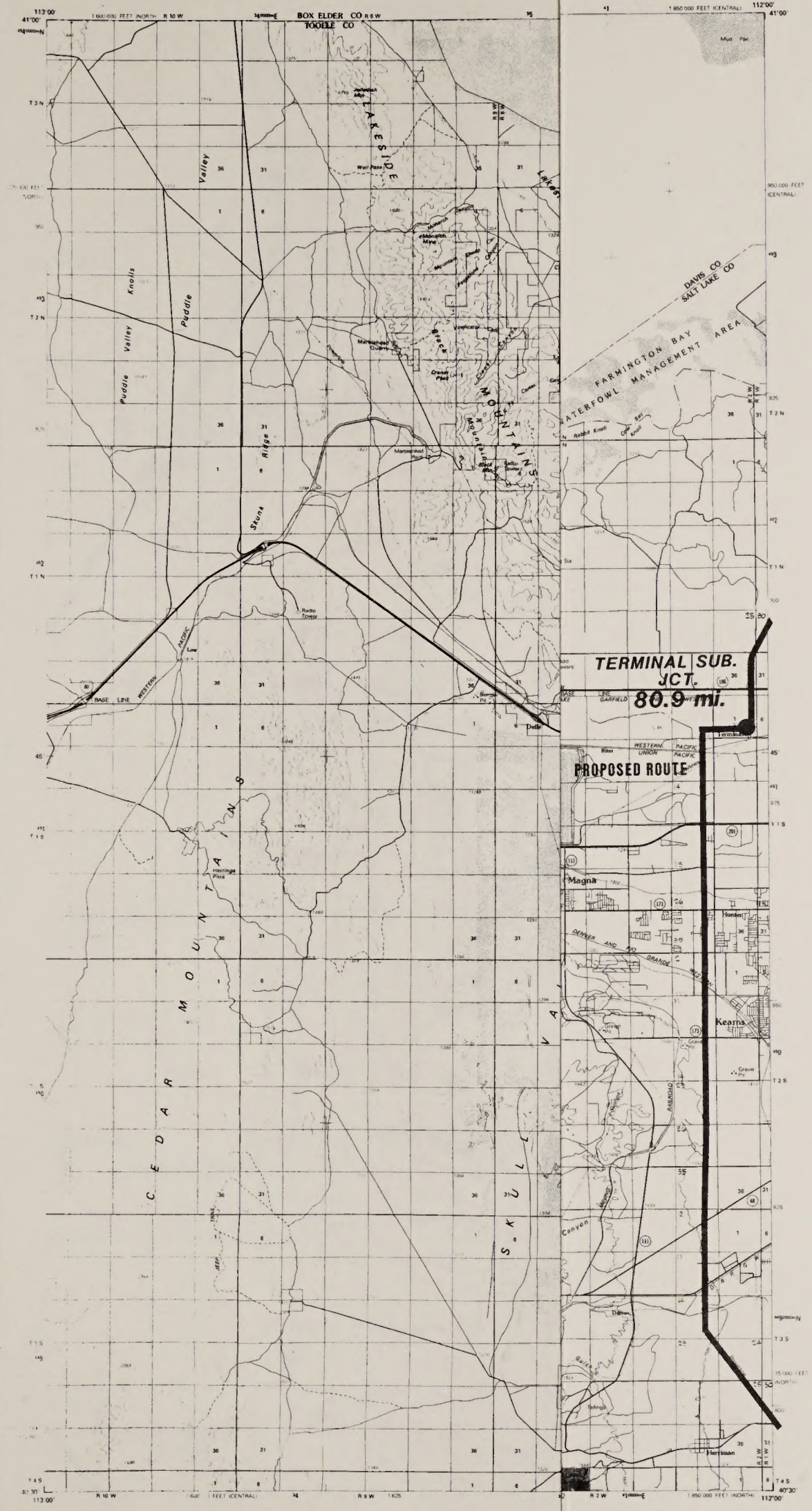
# -WILTEL-
# Fiber Optic Cable Right-of-Way

## Environmental Assessment

Project Route Map

Sheet 12 of 34

TOOELE, UT




N

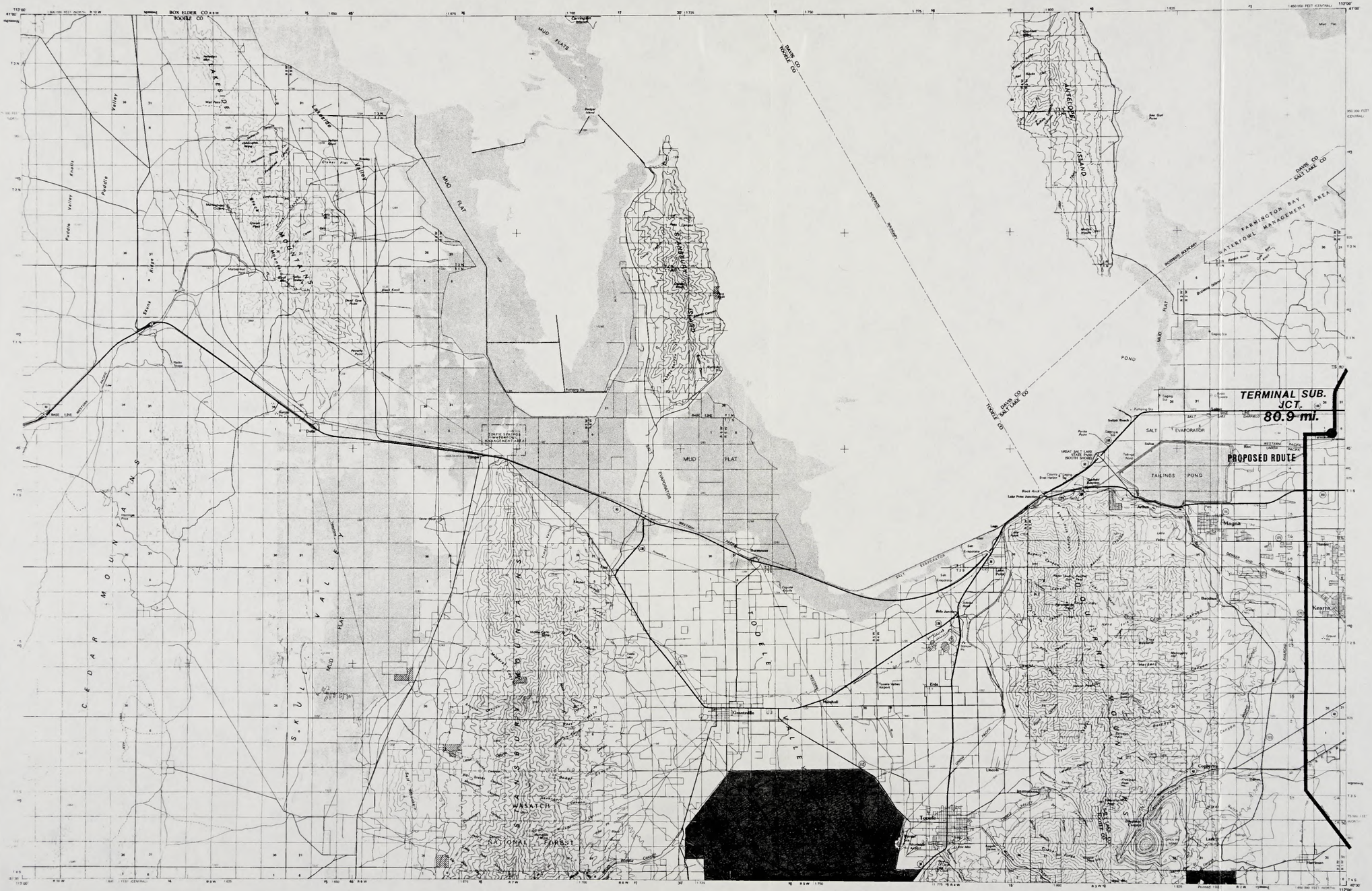
REGENERATOR LOCATIONS

# -WILTEL-
# Fiber Optic Cable Right-of-Way

## Environmental Assessment

Project Route Map
Sheet 12 of 34

TOOELE, UT

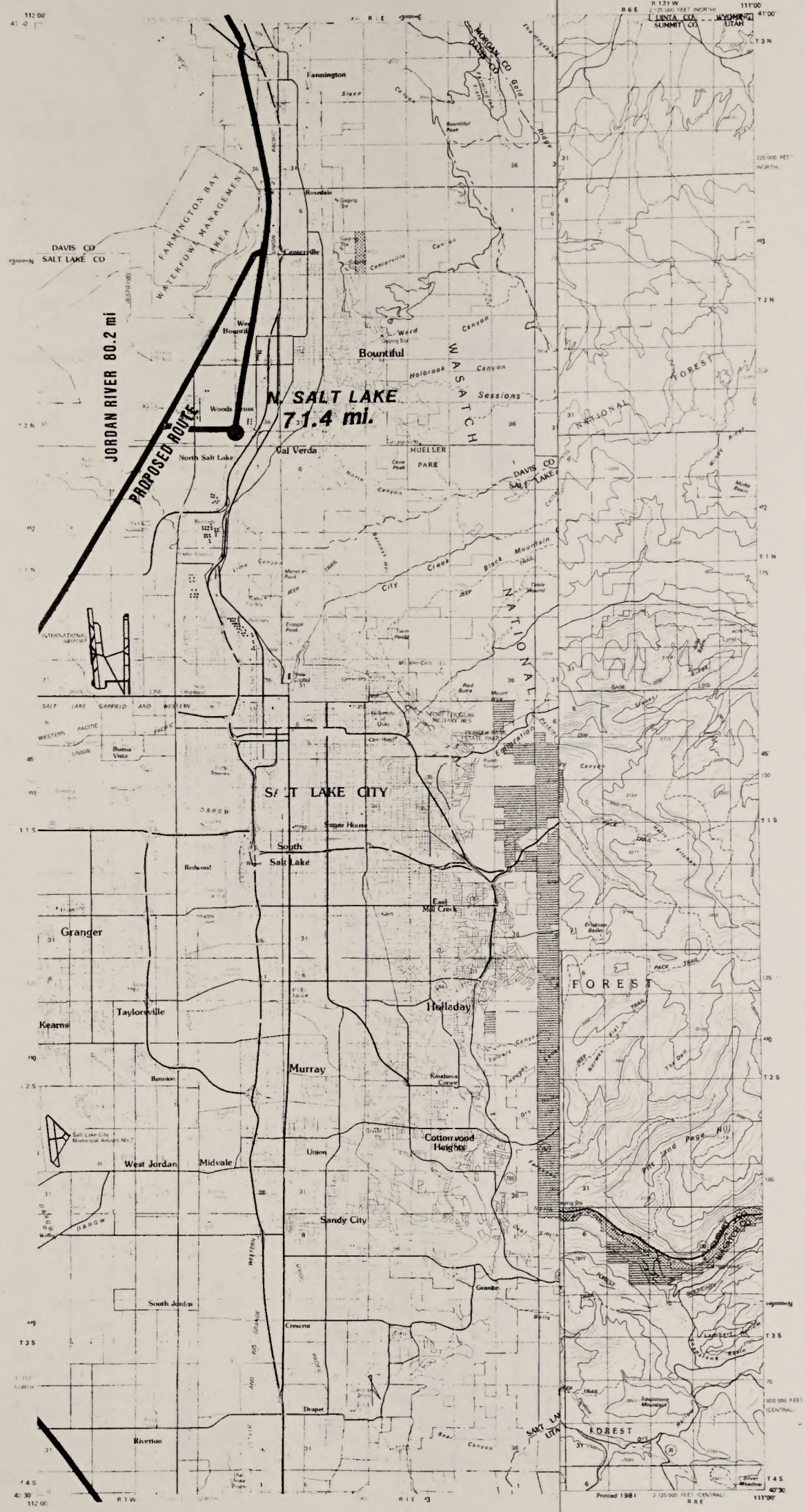


# -WILTEL-
# Fiber Optic Cable Right-of-Way
## Environmental Assessment

Project Route Map

Sheet 13 of 34

SALT LAKE CITY, UT

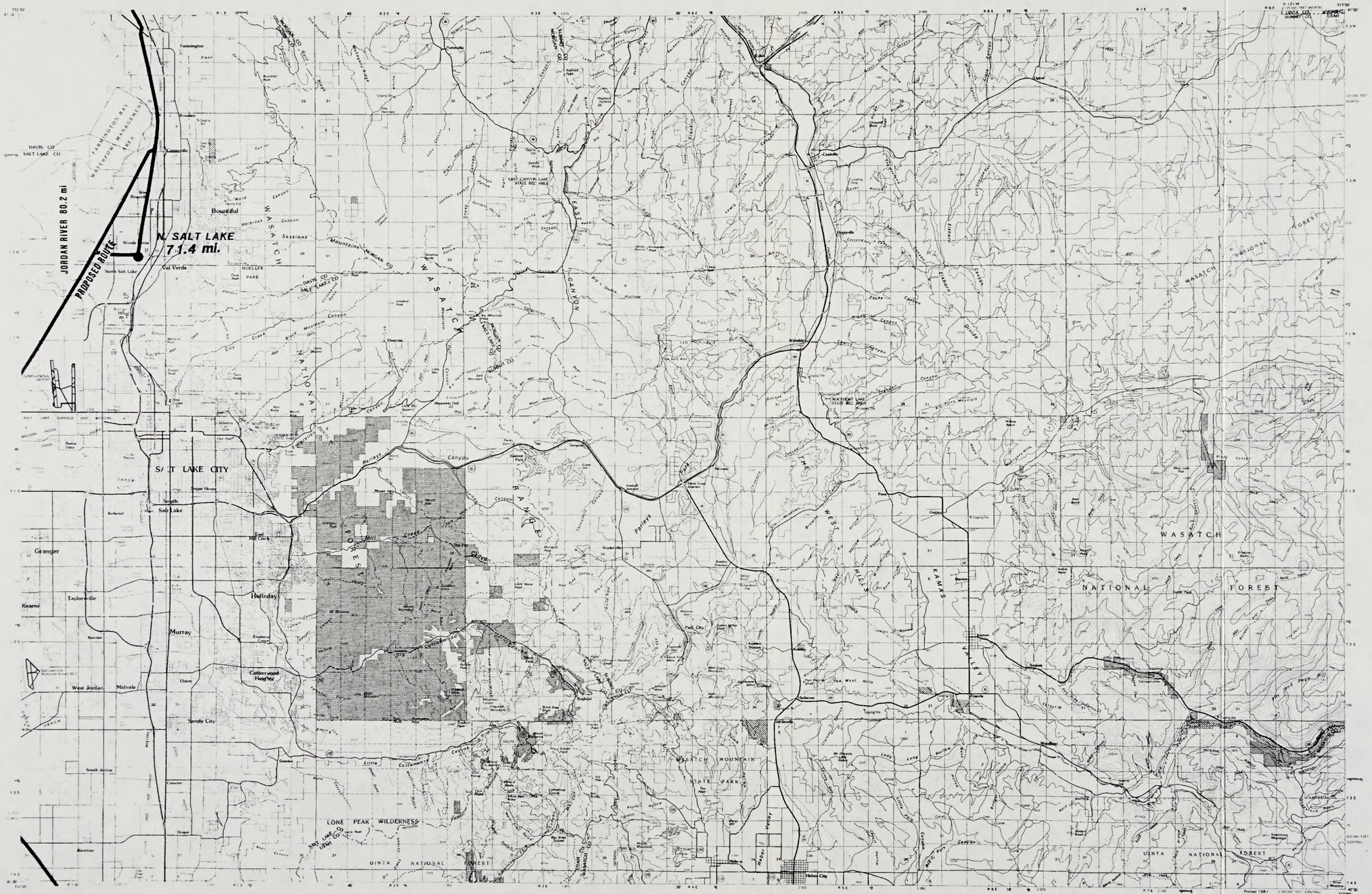



REGENERATOR LOCATIONS

# -WILTEL-
# Fiber Optic Cable Right-of-Way
## Environmental Assessment

Project Route Map
Sheet 13 of 34

SALT LAKE CITY, UT

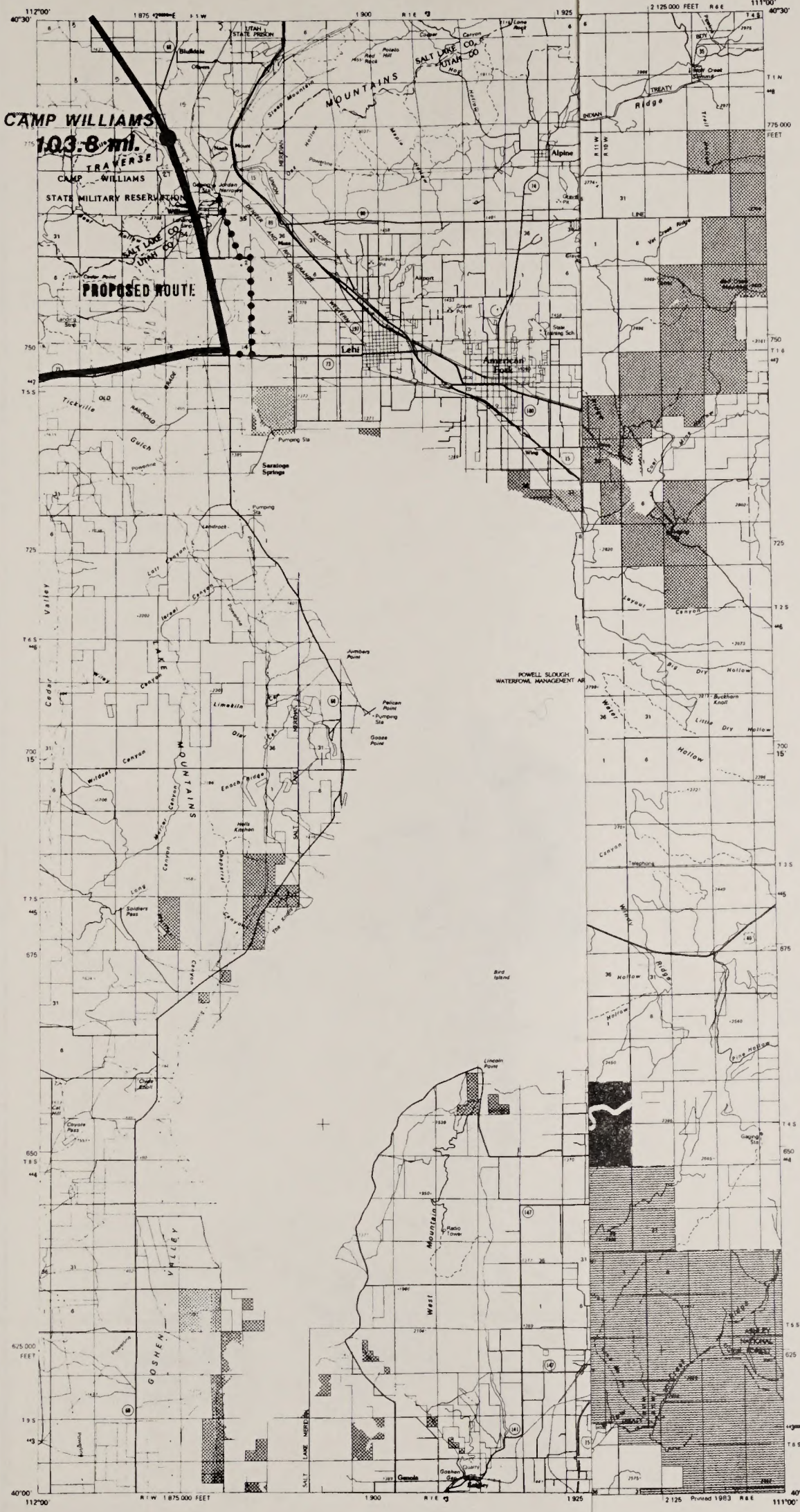



SCALE
1 0 1 2 3 4 5 miles

REGENERATOR LOCATIONS

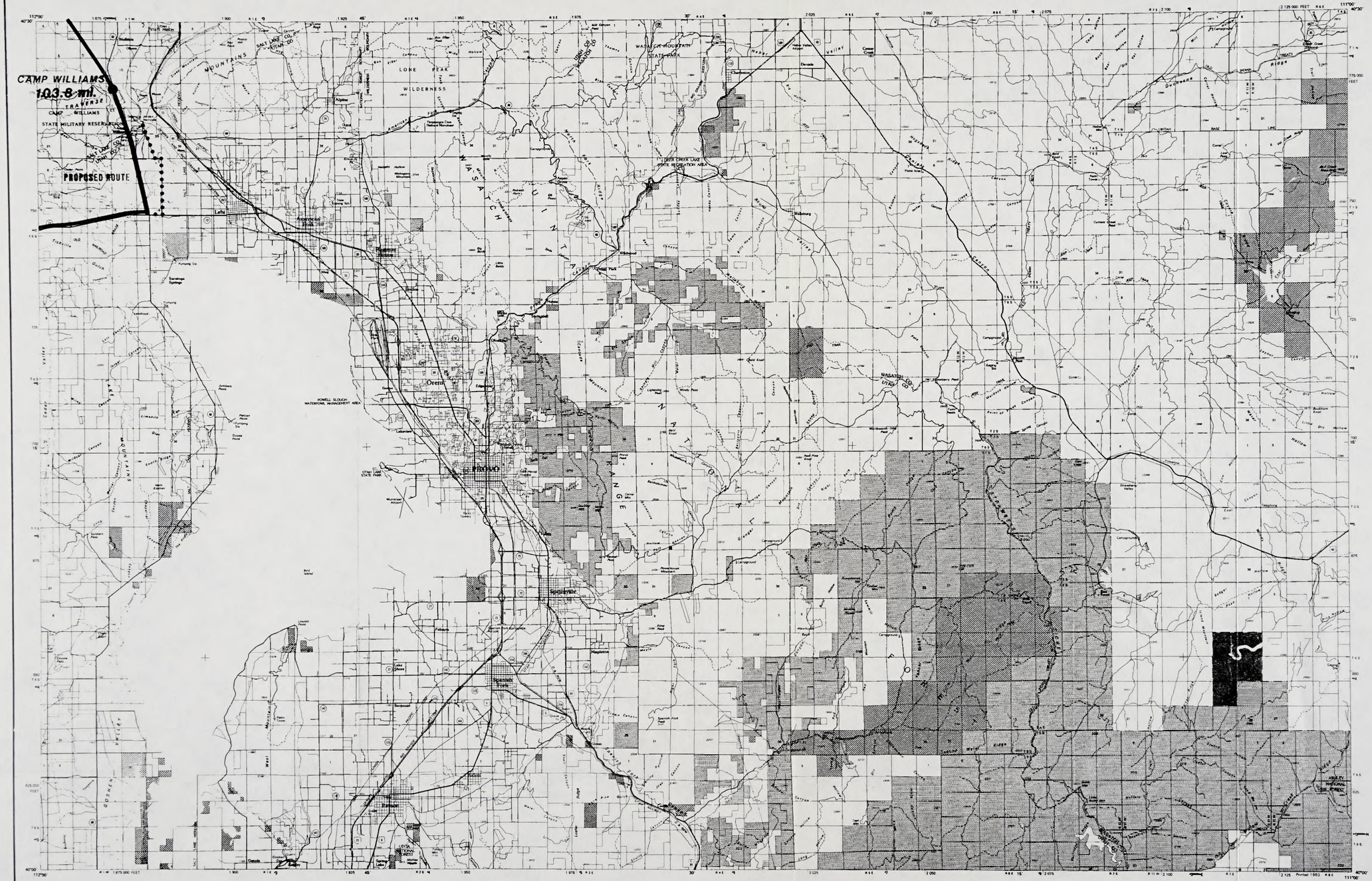
# -WILTEL-
# Fiber Optic Cable Right-of-Way
## Environmental Assessment

Project Route Map
Sheet 14 of 34


CAMP WILLIAMS
103.8 mi.
TRAVERSE
CAMP WILLIAMS
STATE MILITARY RESERVATION
PROPOSED ROUTE
Lehi
American Fork
Alpine
Saratoga Springs
POWELL SLOUGH WATERFOWL MANAGEMENT AR
MOUNTAINS
Ridge
Valley
Gulch
Canyon
Hollow
Mountain
Point
Pumping Sta
Radio Tower
Gosheny Gate
Creek
Bird Island
Lincoln Point
Pelican Point
Goose Point
Jumbers Point
Limekiln
Enoch Ridge
Soldiers Pass
Buckhorn Knoll
Pine Hollow
Coyote Pass
Cedar Valley
Lake
Salt Lake Co.
Utah Co.
Utah State Prison
Camp
Airport
Gravel Pit
Quarry
Tickville
Old Railroad
Beach
Lake Shore
Pacific
Union
Meridian
Base
Indian Treaty
Line
Trail
Wash
Dry
Little
Big
Twelvemile
Buckhorn
Wildcat
Long
Cedar
Jordan Narrows
Red Rock
Potato Hill
Steep Mountain
Lone Rock
Copper Canyon
Red Ledge
Cedar Point
Cedar Hill
Kel Hill
Chicle Knoll
Hells Kitchen
Lincoln Point
Radio Tower
Gaging Sta
Gosheny Gate
Quarry
Pumping Sta
Landrock
Pioneer
Powerline
Aqueduct
Reservoir
State Training Sch
Utah State Prison
Bluffdale
Orem
Provo
Geneva
Saltair
Lehi
Alpine
Saratoga Springs
Goshen
Eagle Mountain
Cedar Fort
Fairfield
Camp Williams
Jordan River
Utah Lake
Provo Bay
Provo River
Provo Reservoir
Deer Creek Reservoir
Deer Creek Dam
Provo Canyon
Provo Airport
Provo Municipal Golf Course
Provo Municipal Golf Course
Provo Municipal Golf Course

# -WILTEL-
# Fiber Optic Cable Right-of-Way
## Environmental Assessment

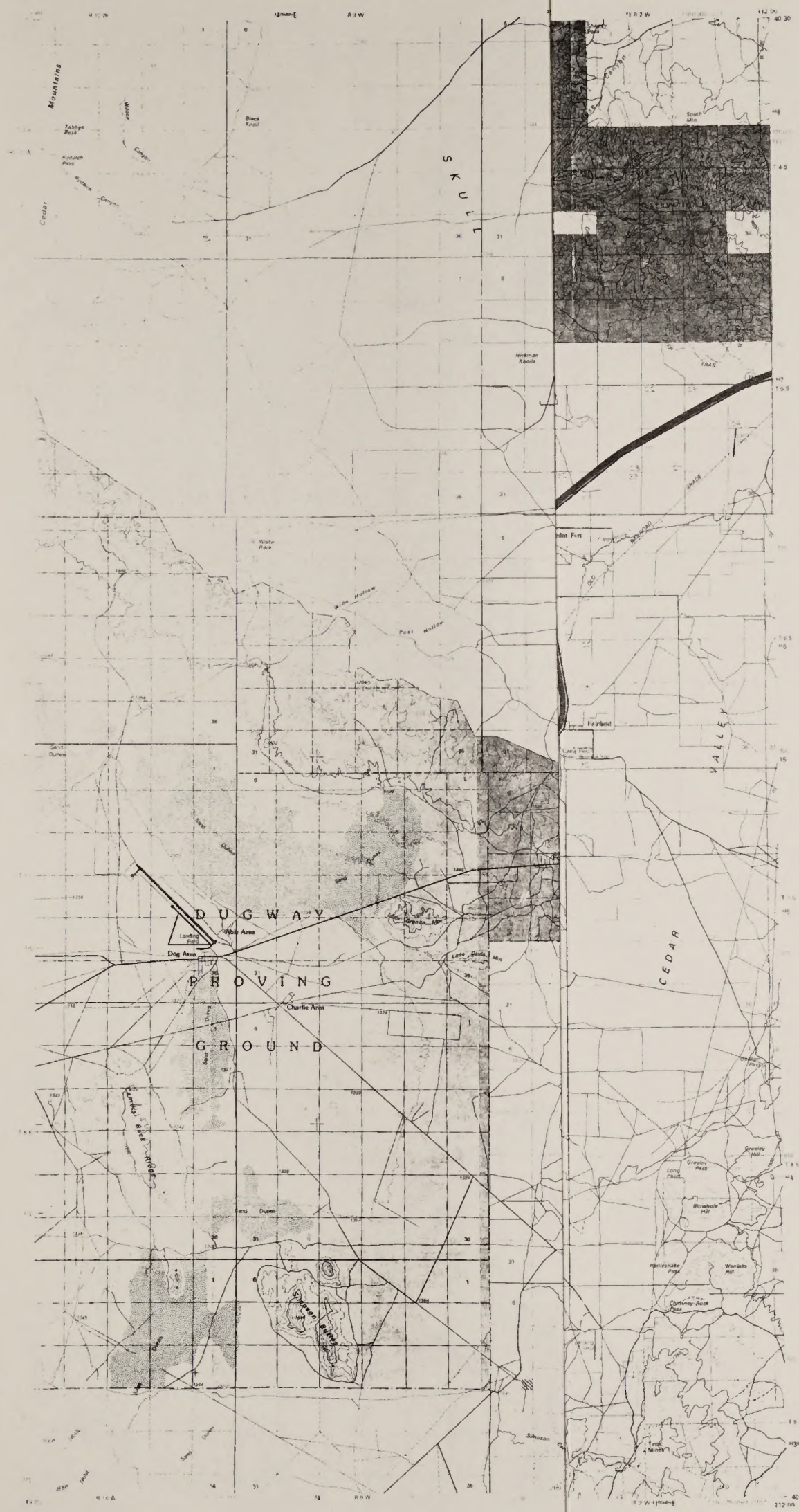
Project Route Map
Sheet 14 of 34


CAMP WILLIAMS
103.6 mi.
CAMP WILLIAMS
STATE MILITARY RESERVATION
PROPOSED ROUTE
LONE PEAK WILDERNESS
WASATCH MOUNTAIN STATE PARK
PROVO
Orem
Spanish Fork
Springville
Payson
Lehi
American Fork
Alpine
Heber
Midway
Provo River
Utah Lake
Jordan River
Wasatch Mountains
Wasatch Range
Utah Valley
Goshen Valley
West Mountain
Provo Bench
Provo Canyon
Provo River
Provo River Canyon
Provo River Drive
Provo River Trail
Provo River Delta
Provo River Falls
Provo River Falls Campground
Provo River Falls Trail
Provo River Falls Trailhead
Provo River Falls Trailhead Parking
Provo River Falls Trailhead Parking Lot
Provo River Falls Trailhead Parking Lot Entrance
Provo River Falls Trailhead Parking Lot Exit
Provo River Falls Trailhead Parking Lot Restroom
Provo River Falls Trailhead Parking Lot Restroom Entrance
Provo River Falls Trailhead Parking Lot Restroom Exit
Provo River Falls Trailhead Parking Lot Restroom Entrance Sign
Provo River Falls Trailhead Parking Lot Restroom Exit Sign
Provo River Falls Trailhead Parking Lot Restroom Entrance Sign Post
Provo River Falls Trailhead Parking Lot Restroom Exit Sign Post
Provo River Falls Trailhead Parking Lot Restroom Entrance Sign Post Base
Provo River Falls Trailhead Parking Lot Restroom Exit Sign Post Base
Provo River Falls Trailhead Parking Lot Restroom Entrance Sign Post Base Concrete
Provo River Falls Trailhead Parking Lot Restroom Exit Sign Post Base Concrete
Provo River Falls Trailhead Parking Lot Restroom Entrance Sign Post Base Concrete Footing
Provo River Falls Trailhead Parking Lot Restroom Exit Sign Post Base Concrete Footing
Provo River Falls Trailhead Parking Lot Restroom Entrance Sign Post Base Concrete Footing Reinforcement
Provo River Falls Trailhead Parking Lot Restroom Exit Sign Post Base Concrete Footing Reinforcement
Provo River Falls Trailhead Parking Lot Restroom Entrance Sign Post Base Concrete Footing Reinforcement Steel
Provo River Falls Trailhead Parking Lot Restroom Exit Sign Post Base Concrete Footing Reinforcement Steel
Provo River Falls Trailhead Parking Lot Restroom Entrance Sign Post Base Concrete Footing Reinforcement Steel Rebar
Provo River Falls Trailhead Parking Lot Restroom Exit Sign Post Base Concrete Footing Reinforcement Steel Rebar
Provo River Falls Trailhead Parking Lot Restroom Entrance Sign Post Base Concrete Footing Reinforcement Steel Rebar Tie
Provo River Falls Trailhead Parking Lot Restroom Exit Sign Post Base Concrete Footing Reinforcement Steel Rebar Tie
Provo River Falls Trailhead Parking Lot Restroom Entrance Sign Post Base Concrete Footing Reinforcement Steel Rebar Tie Wire
Provo River Falls Trailhead Parking Lot Restroom Exit Sign Post Base Concrete Footing Reinforcement Steel Rebar Tie Wire
Provo River Falls Trailhead Parking Lot Restroom Entrance Sign Post Base Concrete Footing Reinforcement Steel Rebar Tie Wire Twist
Provo River Falls Trailhead Parking Lot Restroom Exit Sign Post Base Concrete Footing Reinforcement Steel Rebar Tie Wire Twist
Provo River Falls Trailhead Parking Lot Restroom Entrance Sign Post Base Concrete Footing Reinforcement Steel Rebar Tie Wire Twist Tool
Provo River Falls Trailhead Parking Lot Restroom Exit Sign Post Base Concrete Footing Reinforcement Steel Rebar Tie Wire Twist Tool
Provo River Falls Trailhead Parking Lot Restroom Entrance Sign Post Base Concrete Footing Reinforcement Steel Rebar Tie Wire Twist Tool Handle
Provo River Falls Trailhead Parking Lot Restroom Exit Sign Post Base Concrete Footing Reinforcement Steel Rebar Tie Wire Twist Tool Handle
Provo River Falls Trailhead Parking Lot Restroom Entrance Sign Post Base Concrete Footing Reinforcement Steel Rebar Tie Wire Twist Tool Handle Grip
Provo River Falls Trailhead Parking Lot Restroom Exit Sign Post Base Concrete Footing Reinforcement Steel Rebar Tie Wire Twist Tool Handle Grip
Provo River Falls Trailhead Parking Lot Restroom Entrance Sign Post Base Concrete Footing Reinforcement Steel Rebar Tie Wire Twist Tool Handle Grip Rubber
Provo River Falls Trailhead Parking Lot Restroom Exit Sign Post Base Concrete Footing Reinforcement Steel Rebar Tie Wire Twist Tool Handle Grip Rubber
Provo River Falls Trailhead Parking Lot Restroom Entrance Sign Post Base Concrete Footing Reinforcement Steel Rebar Tie Wire Twist Tool Handle Grip Rubber Plastic
Provo River Falls Trailhead Parking Lot Restroom Exit Sign Post Base Concrete Footing Reinforcement Steel Rebar Tie Wire Twist Tool Handle Grip Rubber Plastic
Provo River Falls Trailhead Parking Lot Restroom Entrance Sign Post Base Concrete Footing Reinforcement Steel Rebar Tie Wire Twist Tool Handle Grip Rubber Plastic Metal
Provo River Falls Trailhead Parking Lot Restroom Exit Sign Post Base Concrete Footing Reinforcement Steel Rebar Tie Wire Twist Tool Handle Grip Rubber Plastic Metal
Provo River Falls Trailhead Parking Lot Restroom Entrance Sign Post Base Concrete Footing Reinforcement Steel Rebar Tie Wire Twist Tool Handle Grip Rubber Plastic Metal Aluminum
Provo River Falls Trailhead Parking Lot Restroom Exit Sign Post Base Concrete Footing Reinforcement Steel Rebar Tie Wire Twist Tool Handle Grip Rubber Plastic Metal Aluminum
Provo River Falls Trailhead Parking Lot Restroom Entrance Sign Post Base Concrete Footing Reinforcement Steel Rebar Tie Wire Twist Tool Handle Grip Rubber Plastic Metal Aluminum Alloy
Provo River Falls Trailhead Parking Lot Restroom Exit Sign Post Base Concrete Footing Reinforcement Steel Rebar Tie Wire Twist Tool Handle Grip Rubber Plastic Metal Aluminum Alloy
Provo River Falls Trailhead Parking Lot Restroom Entrance Sign Post Base Concrete Footing Reinforcement Steel Rebar Tie Wire Twist Tool Handle Grip Rubber Plastic Metal Aluminum Alloy Composite
Provo River Falls Trailhead Parking Lot Restroom Exit Sign Post Base Concrete Footing Reinforcement Steel Rebar Tie Wire Twist Tool Handle Grip Rubber Plastic Metal Aluminum Alloy Composite
Provo River Falls Trailhead Parking Lot Restroom Entrance Sign Post Base Concrete Footing Reinforcement Steel Rebar Tie Wire Twist Tool Handle Grip Rubber Plastic Metal Aluminum Alloy Composite Material
Provo River Falls Trailhead Parking Lot Restroom Exit Sign Post Base Concrete Footing Reinforcement Steel Rebar Tie Wire Twist Tool Handle Grip Rubber Plastic Metal Aluminum Alloy Composite Material
Provo River Falls Trailhead Parking Lot Restroom Entrance Sign Post Base Concrete Footing Reinforcement Steel Rebar Tie Wire Twist Tool Handle Grip Rubber Plastic Metal Aluminum Alloy Composite Material Fiberglass
Provo River Falls Trailhead Parking Lot Restroom Exit Sign Post Base Concrete Footing Reinforcement Steel Rebar Tie Wire Twist Tool Handle Grip Rubber Plastic Metal Aluminum Alloy Composite Material Fiberglass
Provo River Falls Trailhead Parking Lot Restroom Entrance Sign Post Base Concrete Footing Reinforcement Steel Rebar Tie Wire Twist Tool Handle Grip Rubber Plastic Metal Aluminum Alloy Composite Material Fiberglass Resin
Provo River Falls Trailhead Parking Lot Restroom Exit Sign Post Base Concrete Footing Reinforcement Steel Rebar Tie Wire Twist Tool Handle Grip Rubber Plastic Metal Aluminum Alloy Composite Material Fiberglass Resin
Provo River Falls Trailhead Parking Lot Restroom Entrance Sign Post Base Concrete Footing Reinforcement Steel Rebar Tie Wire Twist Tool Handle Grip Rubber Plastic Metal Aluminum Alloy Composite Material Fiberglass Resin Matrix
Provo River Falls Trailhead Parking Lot Restroom Exit Sign Post Base Concrete Footing Reinforcement Steel Rebar Tie Wire Twist Tool Handle Grip Rubber Plastic Metal Aluminum Alloy Composite Material Fiberglass Resin Matrix
Provo River Falls Trailhead Parking Lot Restroom Entrance Sign Post Base Concrete Footing Reinforcement Steel Rebar Tie Wire Twist Tool Handle Grip Rubber Plastic Metal Aluminum Alloy Composite Material Fiberglass Resin Matrix Polyester
Provo River Falls Trailhead Parking Lot Restroom Exit Sign Post Base Concrete Footing Reinforcement Steel Rebar Tie Wire Twist Tool Handle Grip Rubber Plastic Metal Aluminum Alloy Composite Material Fiberglass Resin Matrix Polyester
Provo River Falls Trailhead Parking Lot Restroom Entrance Sign Post Base Concrete Footing Reinforcement Steel Rebar Tie Wire Twist Tool Handle Grip Rubber Plastic Metal Aluminum Alloy Composite Material Fiberglass Resin Matrix Polyester Resin
Provo River Falls Trailhead Parking Lot Restroom Exit Sign Post Base Concrete Footing Reinforcement Steel Rebar Tie Wire Twist Tool Handle Grip Rubber Plastic Metal Aluminum Alloy Composite Material Fiberglass Resin Matrix Polyester Resin
Provo River Falls Trailhead Parking Lot Restroom Entrance Sign Post Base Concrete Footing Reinforcement Steel Rebar Tie Wire Twist Tool Handle Grip Rubber Plastic Metal Aluminum Alloy Composite Material Fiberglass Resin Matrix Polyester Resin Matrix
Provo River Falls Trailhead Parking Lot Restroom Exit Sign Post Base Concrete Footing Reinforcement Steel Rebar Tie Wire Twist Tool Handle Grip Rubber Plastic Metal Aluminum Alloy Composite Material Fiberglass Resin Matrix Polyester Resin Matrix
Provo River Falls Trailhead Parking Lot Restroom Entrance Sign Post Base Concrete Footing Reinforcement Steel Rebar Tie Wire Twist Tool Handle Grip Rubber Plastic Metal Aluminum Alloy Composite Material Fiberglass Resin Matrix Polyester Resin Matrix Material
Provo River Falls Trailhead Parking Lot Restroom Exit Sign Post Base Concrete Footing Reinforcement Steel Rebar Tie Wire Twist Tool Handle Grip Rubber Plastic Metal Aluminum Alloy Composite Material Fiberglass Resin Matrix Polyester Resin Matrix Material
Provo River Falls Trailhead Parking Lot Restroom Entrance Sign Post Base Concrete Footing Reinforcement Steel Rebar Tie Wire Twist Tool Handle Grip Rubber Plastic Metal Aluminum Alloy Composite Material Fiberglass Resin Matrix Polyester Resin Matrix Material Material
Provo River Falls Trailhead Parking Lot Restroom Exit Sign Post Base Concrete Footing Reinforcement Steel Rebar Tie Wire Twist Tool Handle Grip Rubber Plastic Metal Aluminum Alloy Composite Material Fiberglass Resin Matrix Polyester Resin Matrix Material Material
Provo River Falls Trailhead Parking Lot Restroom Entrance Sign Post Base Concrete Footing Reinforcement Steel Rebar Tie Wire Twist Tool Handle Grip Rubber Plastic Metal Aluminum Alloy Composite Material Fiberglass Resin Matrix Polyester Resin Matrix Material Material Material
Provo River Falls Trailhead Parking Lot Restroom Exit Sign Post Base Concrete Footing Reinforcement Steel Rebar Tie Wire Twist Tool Handle Grip Rubber Plastic Metal Aluminum Alloy Composite Material Fiberglass Resin Matrix Polyester Resin Matrix Material Material Material
Provo River Falls Trailhead Parking Lot Restroom Entrance Sign Post Base Concrete Footing Reinforcement Steel Rebar Tie Wire Twist Tool Handle Grip Rubber Plastic Metal Aluminum Alloy Composite Material Fiberglass Resin Matrix Polyester Resin Matrix Material Material Material Material
Provo River Falls Trailhead Parking Lot Restroom Exit Sign Post Base Concrete Footing Reinforcement Steel Rebar Tie Wire Twist Tool Handle Grip Rubber Plastic Metal Aluminum Alloy Composite Material Fiberglass Resin Matrix Polyester Resin Matrix Material Material Material Material
Provo River Falls Trailhead Parking Lot Restroom Entrance Sign Post Base Concrete Footing Reinforcement Steel Rebar Tie Wire Twist Tool Handle Grip Rubber Plastic Metal Aluminum Alloy Composite Material Fiberglass Resin Matrix Polyester Resin Matrix Material Material Material Material Material
Provo River Falls Trailhead Parking Lot Restroom Exit Sign Post Base Concrete Footing Reinforcement Steel Rebar Tie Wire Twist Tool Handle Grip Rubber Plastic Metal Aluminum Alloy Composite Material Fiberglass Resin Matrix Polyester Resin Matrix Material Material Material Material Material
Provo River Falls Trailhead Parking Lot Restroom Entrance Sign Post Base Concrete Footing Reinforcement Steel Rebar Tie Wire Twist Tool Handle Grip Rubber Plastic Metal Aluminum Alloy Composite Material Fiberglass Resin Matrix Polyester Resin Matrix Material Material Material Material Material Material
Provo River Falls Trailhead Parking Lot Restroom Exit Sign Post Base Concrete Footing Reinforcement Steel Rebar Tie Wire Twist Tool Handle Grip Rubber Plastic Metal Aluminum Alloy Composite Material Fiberglass Resin Matrix Polyester Resin Matrix Material Material Material Material Material Material
Provo River Falls Trailhead Parking Lot Restroom Entrance Sign Post Base Concrete Footing Reinforcement Steel Rebar Tie Wire Twist Tool Handle Grip Rubber Plastic Metal Aluminum Alloy Composite Material Fiberglass Resin Matrix Polyester Resin Matrix Material Material Material Material Material Material Material
Provo River Falls Trailhead Parking Lot Restroom Exit Sign Post Base Concrete Footing Reinforcement Steel Rebar Tie Wire Twist Tool Handle Grip Rubber Plastic Metal Aluminum Alloy Composite Material Fiberglass Resin Matrix Polyester Resin Matrix Material Material Material Material Material Material Material
Provo River Falls Trailhead Parking Lot Restroom Entrance Sign Post Base Concrete Footing Reinforcement Steel Rebar Tie Wire Twist Tool Handle Grip Rubber Plastic Metal Aluminum Alloy Composite Material Fiberglass Resin Matrix Polyester Resin Matrix Material Material Material Material Material Material Material Material
Provo River Falls Trailhead Parking Lot Restroom Exit Sign Post Base Concrete Footing Reinforcement Steel Rebar Tie Wire Twist Tool Handle Grip Rubber Plastic Metal Aluminum Alloy Composite Material Fiberglass Resin Matrix Polyester Resin Matrix Material Material Material Material Material Material Material Material
Provo River Falls Trailhead Parking Lot Restroom Entrance Sign Post Base Concrete Footing Reinforcement Steel Rebar Tie Wire Twist Tool Handle Grip Rubber Plastic Metal Aluminum Alloy Composite Material Fiberglass Resin Matrix Polyester Resin Matrix Material Material Material Material Material Material Material Material Material
Provo River Falls Trailhead Parking Lot Restroom Exit Sign Post Base Concrete Footing Reinforcement Steel Rebar Tie Wire Twist Tool Handle Grip Rubber Plastic Metal Aluminum Alloy Composite Material Fiberglass Resin Matrix Polyester Resin Matrix Material Material Material Material Material Material Material Material Material
Provo River Falls Trailhead Parking Lot Restroom Entrance Sign Post Base Concrete Footing Reinforcement Steel Rebar Tie Wire Twist Tool Handle Grip Rubber Plastic Metal Aluminum Alloy Composite Material Fiberglass Resin Matrix Polyester Resin Matrix Material Material Material Material Material Material Material Material Material Material
Provo River Falls Trailhead Parking Lot Restroom Exit Sign Post Base Concrete Footing Reinforcement Steel Rebar Tie Wire Twist Tool Handle Grip Rubber Plastic Metal Aluminum Alloy Composite Material Fiberglass Resin Matrix Polyester Resin Matrix Material Material Material Material Material Material Material Material Material Material
Provo River Falls Trailhead Parking Lot Restroom Entrance Sign Post Base Concrete Footing Reinforcement Steel Rebar Tie Wire Twist Tool Handle Grip Rubber Plastic Metal Aluminum Alloy Composite Material Fiberglass Resin Matrix Polyester Resin Matrix Material Material Material Material Material Material Material Material Material Material Material
Provo River Falls Trailhead Parking Lot Restroom Exit Sign Post Base Concrete Footing Reinforcement Steel Rebar Tie Wire Twist Tool Handle Grip Rubber Plastic Metal Aluminum Alloy Composite Material Fiberglass Resin Matrix Polyester Resin Matrix Material Material Material Material Material Material Material Material Material Material Material
Provo River Falls Trailhead Parking Lot Restroom Entrance Sign Post Base Concrete Footing Reinforcement Steel Rebar Tie Wire Twist Tool Handle Grip Rubber Plastic Metal Aluminum Alloy Composite Material Fiberglass Resin Matrix Polyester Resin Matrix Material Material Material Material Material Material Material Material Material Material Material Material
Provo River Falls Trailhead Parking Lot Restroom Exit Sign Post Base Concrete Footing Reinforcement Steel Rebar Tie Wire Twist Tool Handle Grip Rubber Plastic Metal Aluminum Alloy Composite Material Fiberglass Resin Matrix Polyester Resin Matrix Material Material Material Material Material Material Material Material Material Material Material Material
Provo River Falls Trailhead Parking Lot Restroom Entrance Sign Post Base Concrete Footing Reinforcement Steel Rebar Tie Wire Twist Tool Handle Grip Rubber Plastic Metal Aluminum Alloy Composite Material Fiberglass Resin Matrix Polyester Resin Matrix Material Material Material Material Material Material Material Material Material Material Material Material Material
Provo River Falls Trailhead Parking Lot Restroom Exit Sign Post Base Concrete Footing Reinforcement Steel Rebar Tie Wire Twist Tool Handle Grip Rubber Plastic Metal Aluminum Alloy Composite Material Fiberglass Resin Matrix Polyester Resin Matrix Material Material Material Material Material Material Material Material Material Material Material Material Material
Provo River Falls Trailhead Parking Lot Restroom Entrance Sign Post Base Concrete Footing Reinforcement Steel Rebar Tie Wire Twist Tool Handle Grip Rubber Plastic Metal Aluminum Alloy Composite Material Fiberglass Resin Matrix Polyester Resin Matrix Material Material Material Material Material Material Material Material Material Material Material Material Material Material
Provo River Falls Trailhead Parking Lot Restroom Exit Sign Post Base Concrete Footing Reinforcement Steel Rebar Tie Wire Twist Tool Handle Grip Rubber Plastic Metal Aluminum Alloy Composite Material Fiberglass Resin Matrix Polyester Resin Matrix Material Material Material Material Material Material Material Material Material Material Material Material Material Material
Provo River Falls Trailhead Parking Lot Restroom Entrance Sign Post Base Concrete Footing Reinforcement Steel Rebar Tie Wire Twist Tool Handle Grip Rubber Plastic Metal Aluminum Alloy Composite Material Fiberglass Resin Matrix Polyester Resin Matrix Material Material Material Material Material Material Material Material Material Material Material Material Material Material Material
Provo River Falls Trailhead Parking Lot Restroom Exit Sign Post Base Concrete Footing Reinforcement Steel Rebar Tie Wire Twist Tool Handle Grip Rubber Plastic Metal Aluminum Alloy Composite Material Fiberglass Resin Matrix Polyester Resin Matrix Material Material Material Material Material Material Material Material Material Material Material Material Material Material Material
Provo River Falls Trailhead Parking Lot Restroom Entrance Sign Post Base Concrete Footing Reinforcement Steel Rebar Tie Wire Twist Tool Handle Grip Rubber Plastic Metal Aluminum Alloy Composite Material Fiberglass Resin Matrix Polyester Resin Matrix Material Material Material Material Material Material Material Material Material Material Material Material Material Material Material Material
Provo River Falls Trailhead Parking Lot Restroom Exit Sign Post Base Concrete Footing Reinforcement Steel Rebar Tie Wire Twist Tool Handle Grip Rubber Plastic Metal Aluminum Alloy Composite Material Fiberglass Resin Matrix Polyester Resin Matrix Material

# -WILTEL-
# Fiber Optic Cable Right-of-Way
## Environmental Assessment

Project Route Map
Sheet 15 of 34

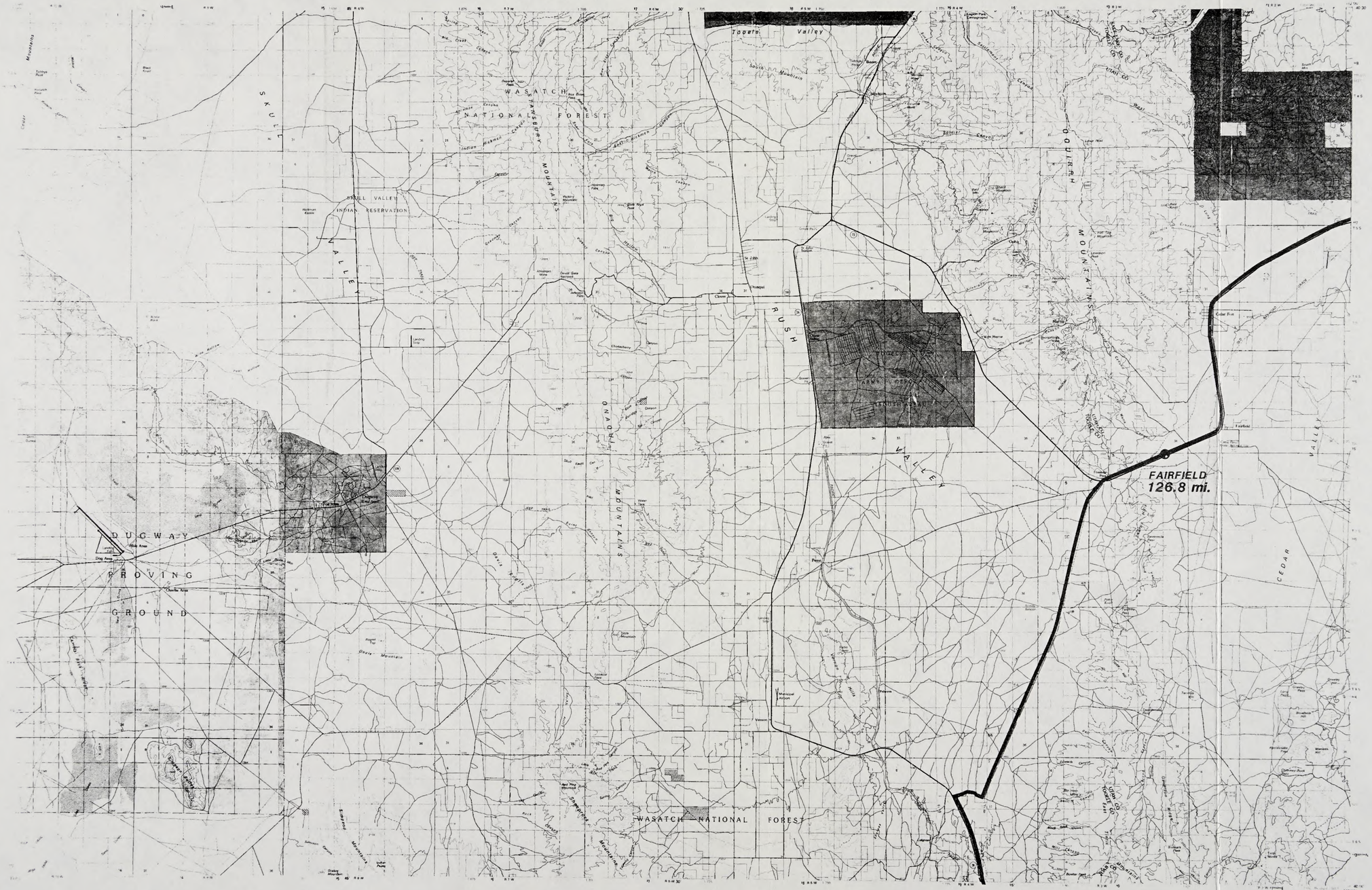
RUSH VALLEY, UT




REGENERATOR LOCATIONS

**-WILTEL-**
**Fiber Optic Cable Right-of-Way**
**Environmental Assessment**
Project Route Map
Sheet 15 of 34

RUSH VALLEY, UT




N

SCALE
1 0 1 2 3 4 5 miles

REGENERATOR LOCATIONS

# -WILTEL-
# Fiber Optic Cable Right-of-Way
## Environmental Assessment

Project Route Map
Sheet 16 of 34

LYNNDYL, UT

REGENERATOR LOCATIONS

# -WILTEL-
# Fiber Optic Cable Right-of-Way
## Environmental Assessment

Project Route Map
Sheet 16 of 34

LYNNDYL, UT

PROPOSED ROUTE

TINTIC
155.8 mi.

LYNNDYL
183.9 mi

WASATCH NATIONAL FOREST

SCALE
1 0 1 2 3 4 5 miles

REGENERATOR LOCATIONS

# -WILTEL-
# Fiber Optic Cable Right-of-Way
## Environmental Assessment

Project Route Map
Sheet 17 of 34

DELTA, UT

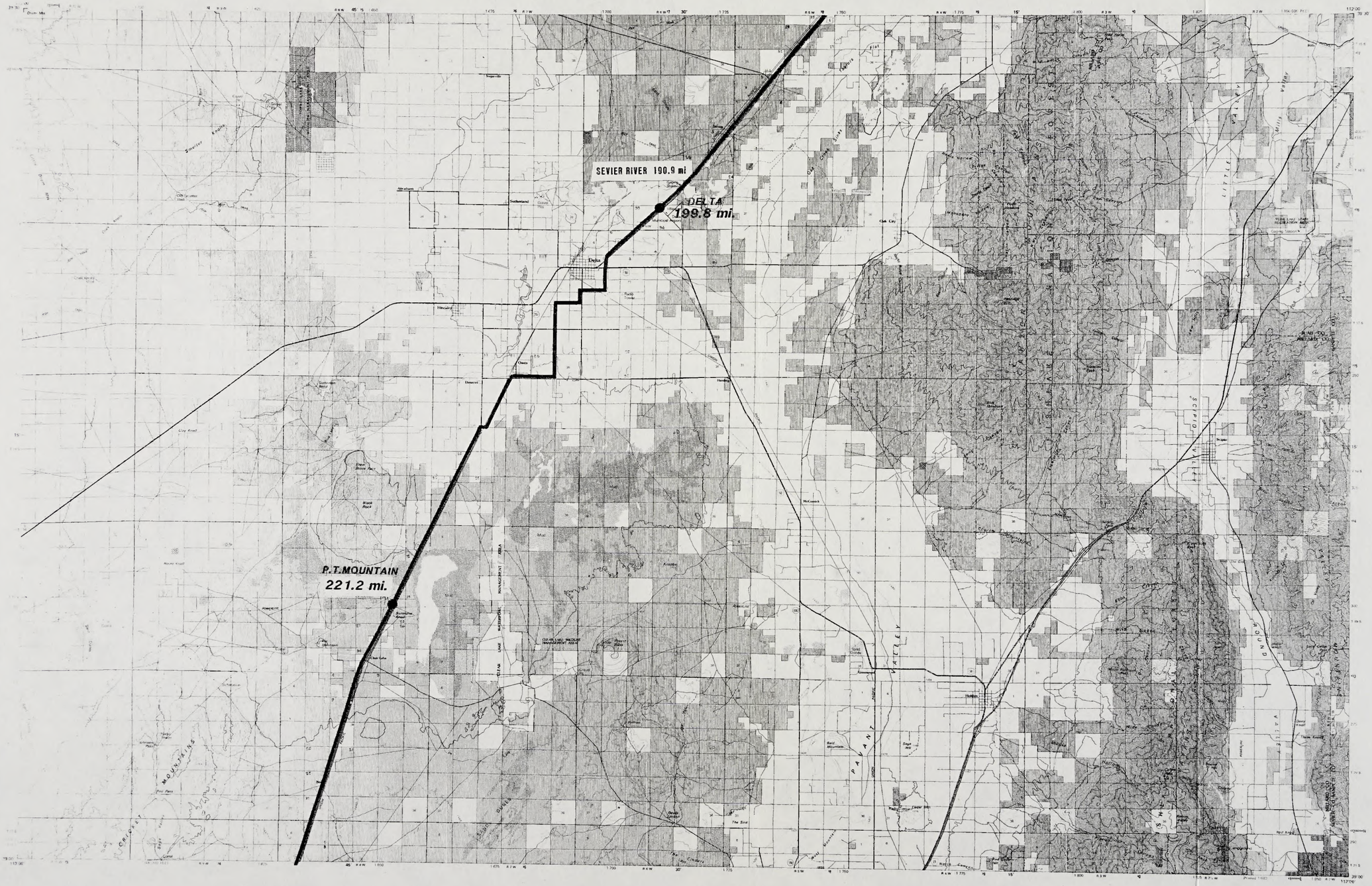
REGENERATOR LOCATIONS

# -WILTEL-
# Fiber Optic Cable Right-of-Way

**Environmental Assessment**

Project Route Map
Sheet 17 of 34

DELTA, UT

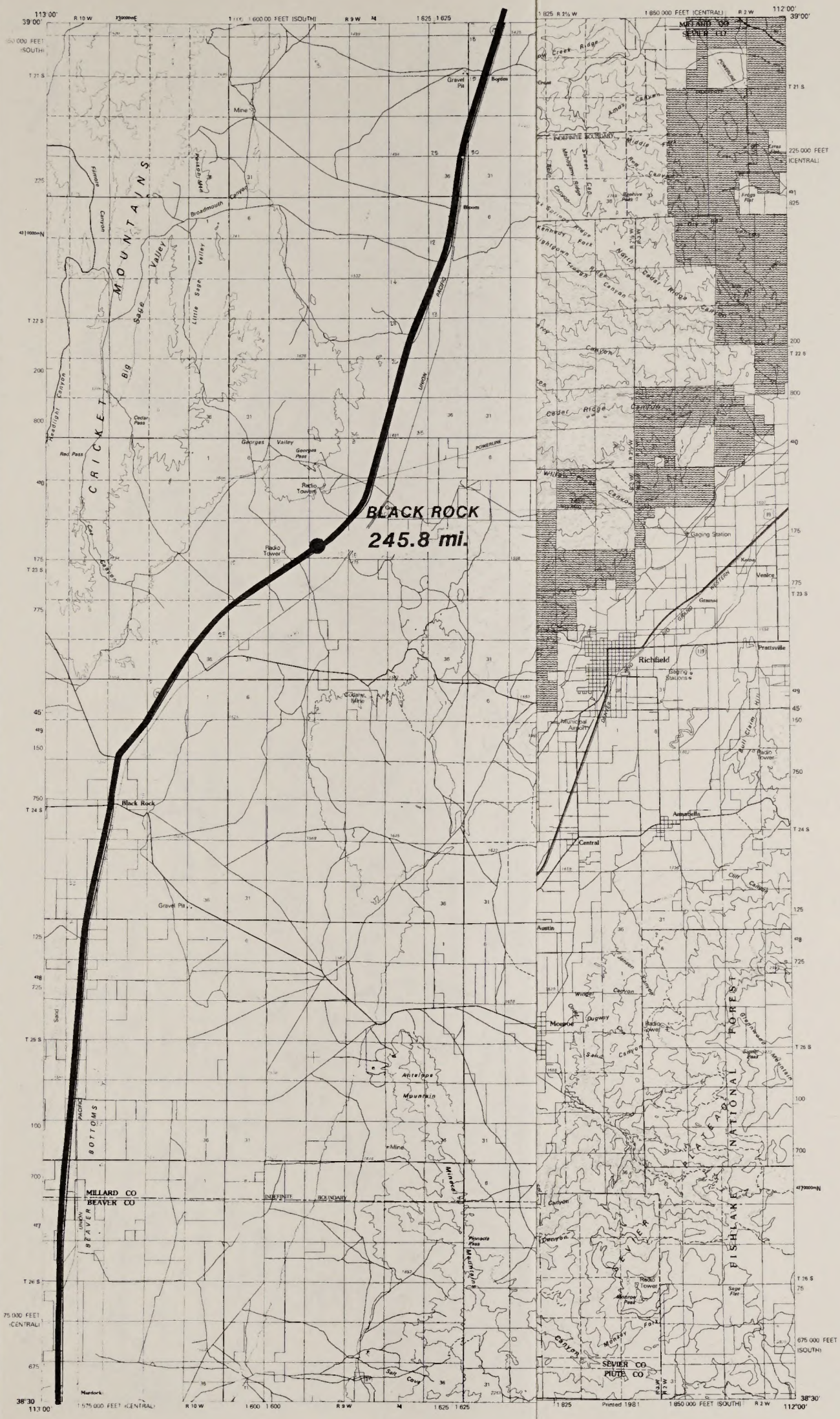

SEVIER RIVER 190.9 mi
DELTA
199.8 mi
P.T.MOUNTAIN
221.2 mi.
Delta
Hinckley
Oak City
Leamington
Lynndyl
Sevier River
Pavant Valley
Sevier Desert
Canyon Mountains
Fillmore
Meadow
Kanosh
Holden
Scipio
Black Rock
Desert
Fumarole Butte
Clear Lake
Deseret
Oasis
Abraham
Sutherland
Flowell
Chase
Elsinore
Hinckley
Oak City
Leamington
Lynndyl
Holden
Scipio
Meadow
Kanosh
Fillmore
Black Rock
Desert
Fumarole Butte
Clear Lake
Deseret
Oasis
Abraham
Sutherland
Flowell
Chase
Elsinore
Sevier River
Pavant Valley
Sevier Desert
Canyon Mountains
Little Valley
Union Valley
Reid Mountain
Sage Hill
Horse Knoll
Dome Knoll
Thorne Knoll
Dairy Knoll
Cove Creek
Meadow Creek
Kanosh Creek
Corn Creek
Oak Creek
Chase Creek
Flowell Creek
Sevier River
Delta Municipal Airport
Topaz Mtn
Dome Mtn
Rock Knoll
Rock Rock
Sand Dunes
Sand Dunes
Sand Dunes
Sand Dunes
The Sink
Sink
Sink

# -WILTEL-
# Fiber Optic Cable Right-of-Way
## Environmental Assessment

Project Route Map

Sheet 18 of 34

RICHFIELD,UT




REGENERATOR LOCATIONS

# -WILTEL-
## Fiber Optic Cable Right-of-Way
## Environmental Assessment

Project Route Map
Sheet 18 of 34

RICHFIELD,UT

BLACK ROCK
245.8 mi.

REGENERATOR LOCATIONS

SCALE
1 0 1 2 3 4 5 miles

# -WILTEL-
# Fiber Optic Cable Right-of-Way
## Environmental Assessment

Project Route Map

Sheet 19 of 34

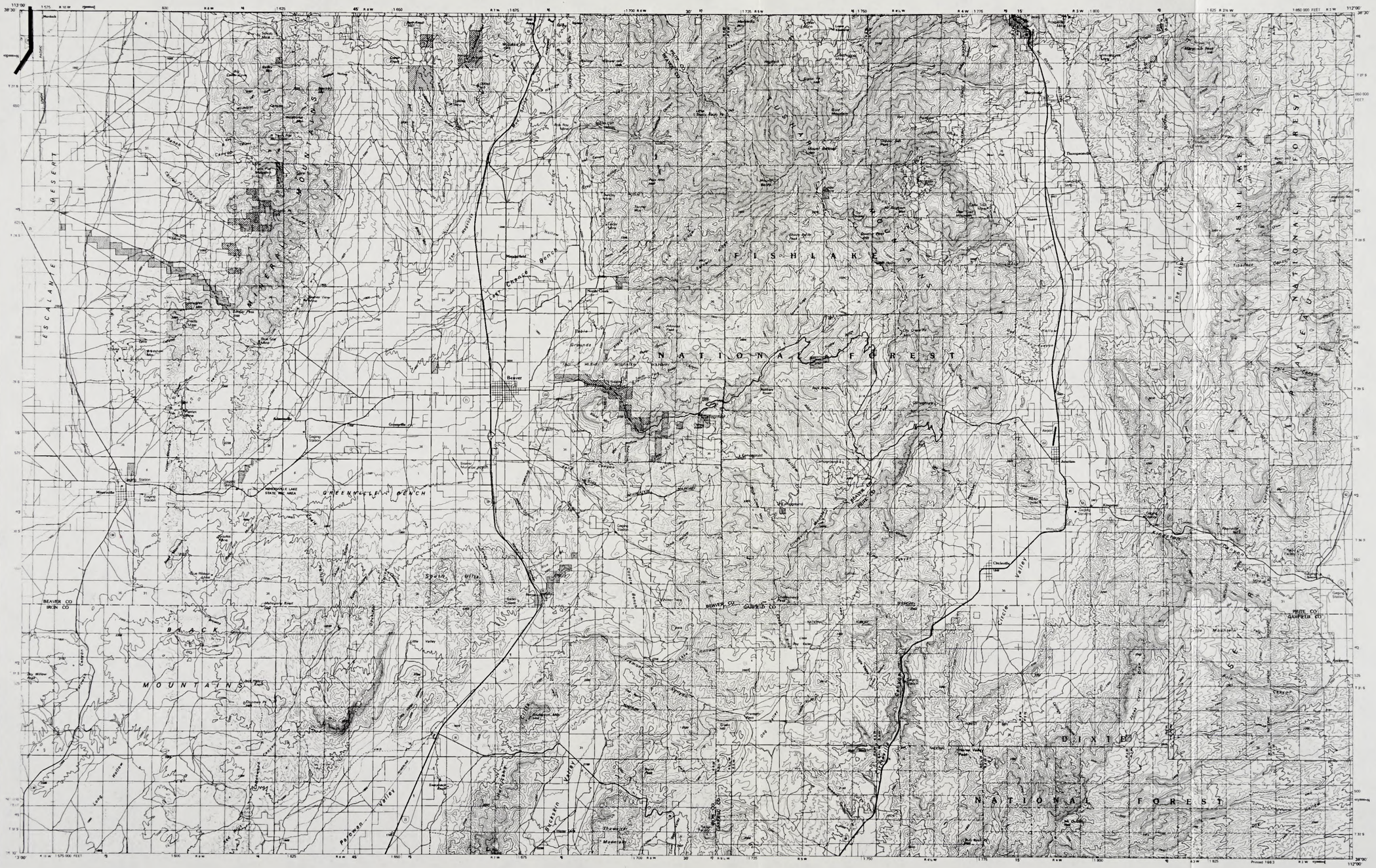
BEAVER, UT

REGENERATOR LOCATIONS

# -WILTEL-
## Fiber Optic Cable Right-of-Way
## Environmental Assessment

Project Route Map
Sheet 19 of 34

BEAVER, UT




SCALE
1 0 1 2 3 4 5 miles

REGENERATOR LOCATIONS

# -WILTEL-
# Fiber Optic Cable Right-of-Way
## Environmental Assessment

Project Route Map
Sheet 20 of 34

WAH WAH MTS., SOUTH, UT

MILFORD NORTH
275.1 mi.

MILFORD SOUTH
289.1 mi.

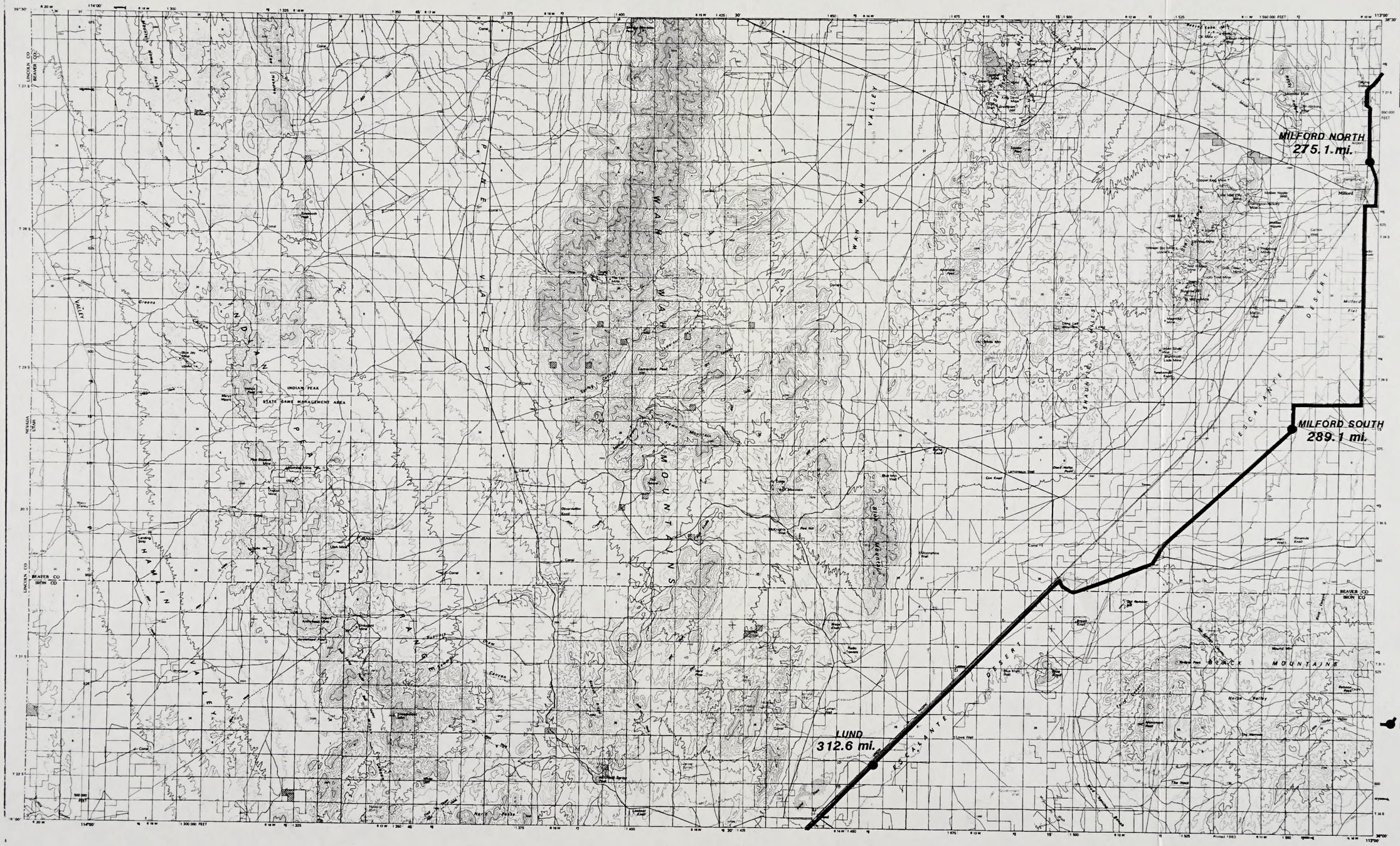
REGENERATOR LOCATIONS

# -WILTEL-
# Fiber Optic Cable Right-of-Way

## Environmental Assessment

Project Route Map
Sheet 20 of 34

WAH WAH MTS., SOUTH, UT



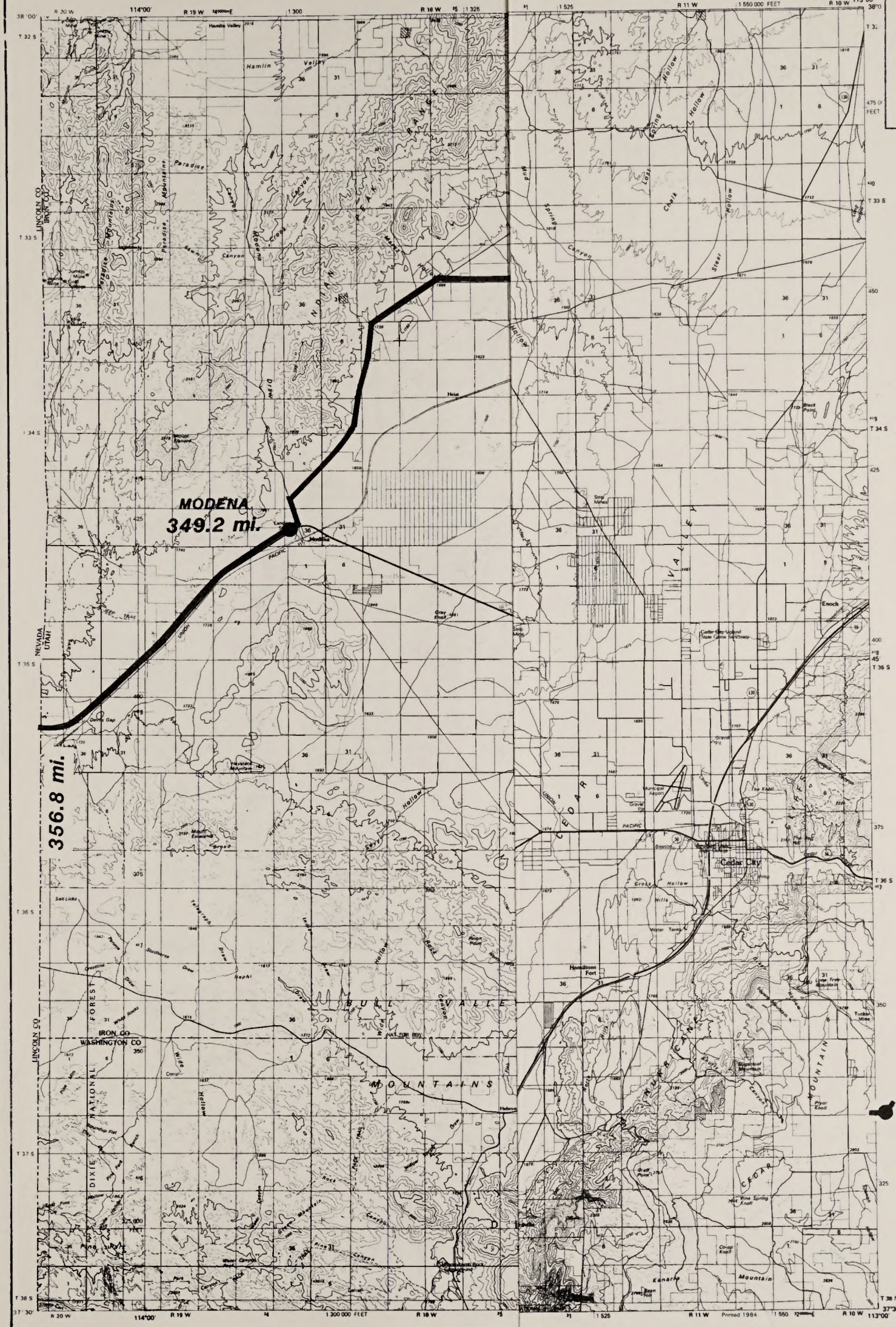

REGENERATOR LOCATIONS

SCALE
1 0 1 2 3 4 5 miles

# -WILTEL-
# Fiber Optic Cable Right-of-Way
## Environmental Assessment

Project Route Map
Sheet 21 of 34

CEDAR CITY, UT



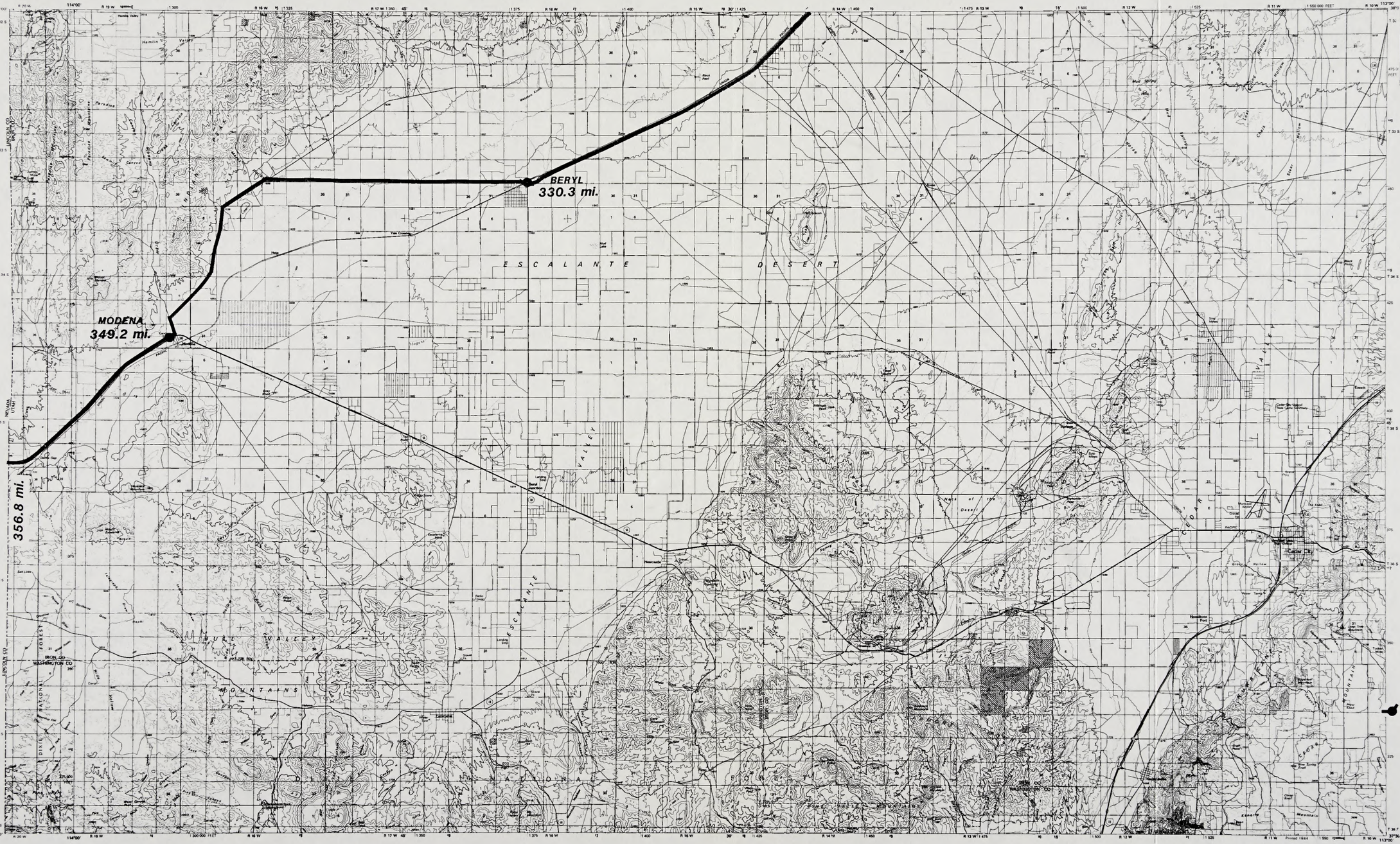

REGENERATOR LOCATIONS

# -WILTEL-
# Fiber Optic Cable Right-of-Way

## Environmental Assessment

Project Route Map
Sheet 21 of 34

CEDAR CITY, UT



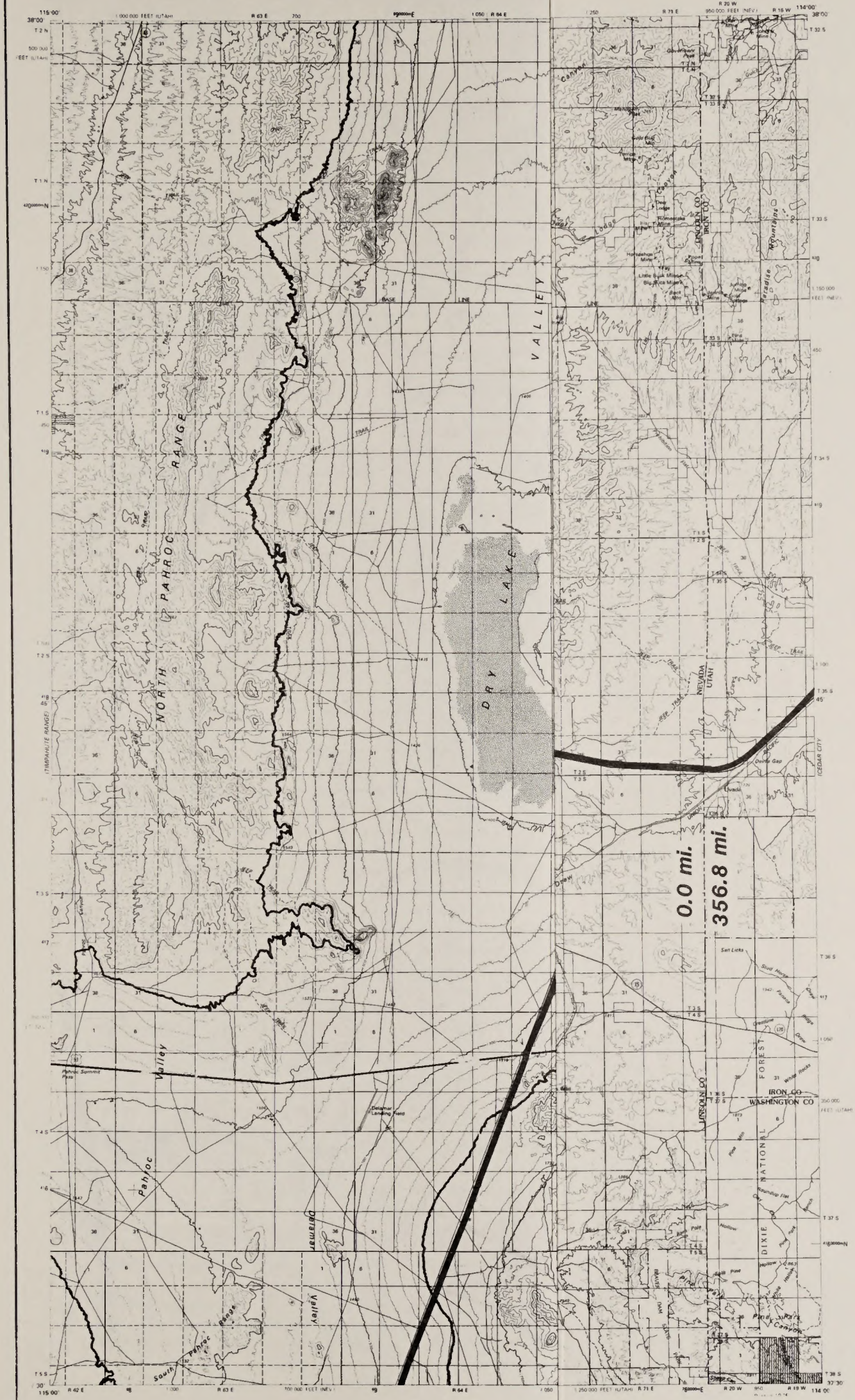

SCALE
1 0 1 2 3 4 5 miles

# -WILTEL-
# Fiber Optic Cable Right-of-Way
## Environmental Assessment

Project Route Map

Sheet 22of 34

CALIENTE, NV




REGENERATOR LOCATIONS

**-WILTEL-**
**Fiber Optic Cable Right-of-Way**

**Environmental Assessment**

Project Route Map
Sheet 22of 34

CALIENTE, NV

PANACA
18.2 mi.

BURNT SPRINGS
71.0 mi.

0.0 mi.

356.8 mi.

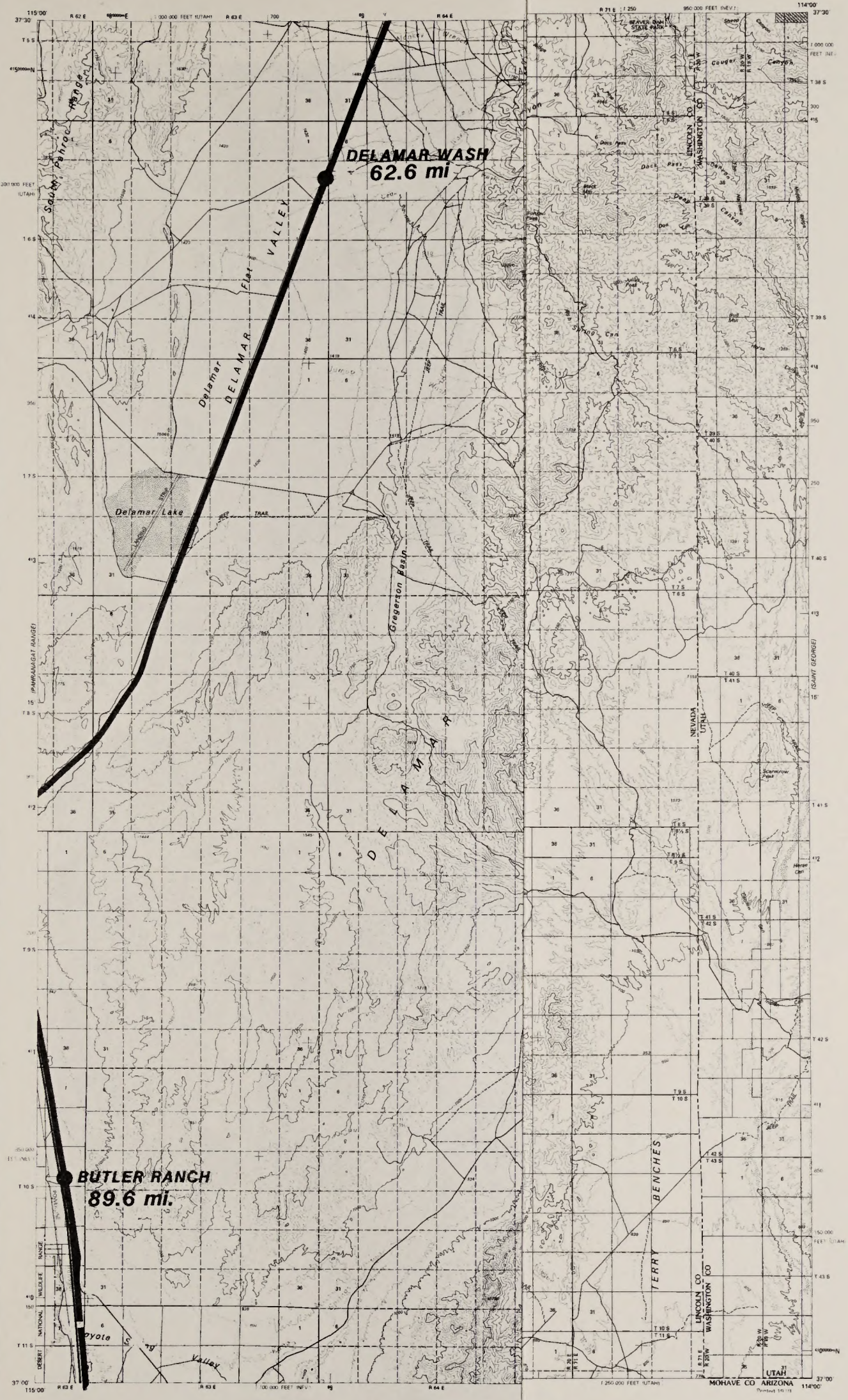
REGENERATOR LOCATIONS

SCALE
1 0 1 2 3 4 5 miles

# -WILTEL-
# Fiber Optic Cable Right-of-Way
## Environmental Assessment

Project Route Map
Sheet 23 of 34

CLOVER MTS., NV




REGENERATOR LOCATIONS

**-WILTEL-**
**Fiber Optic Cable**
**Right-of-Way**

**Environmental Assessment**

Project Route Map
Sheet 23 of 34

CLOVER MTS., NV

DELAMAR WASH
62.6 mi

BUTLER RANCH
89.6 mi.

REGENERATOR LOCATIONS

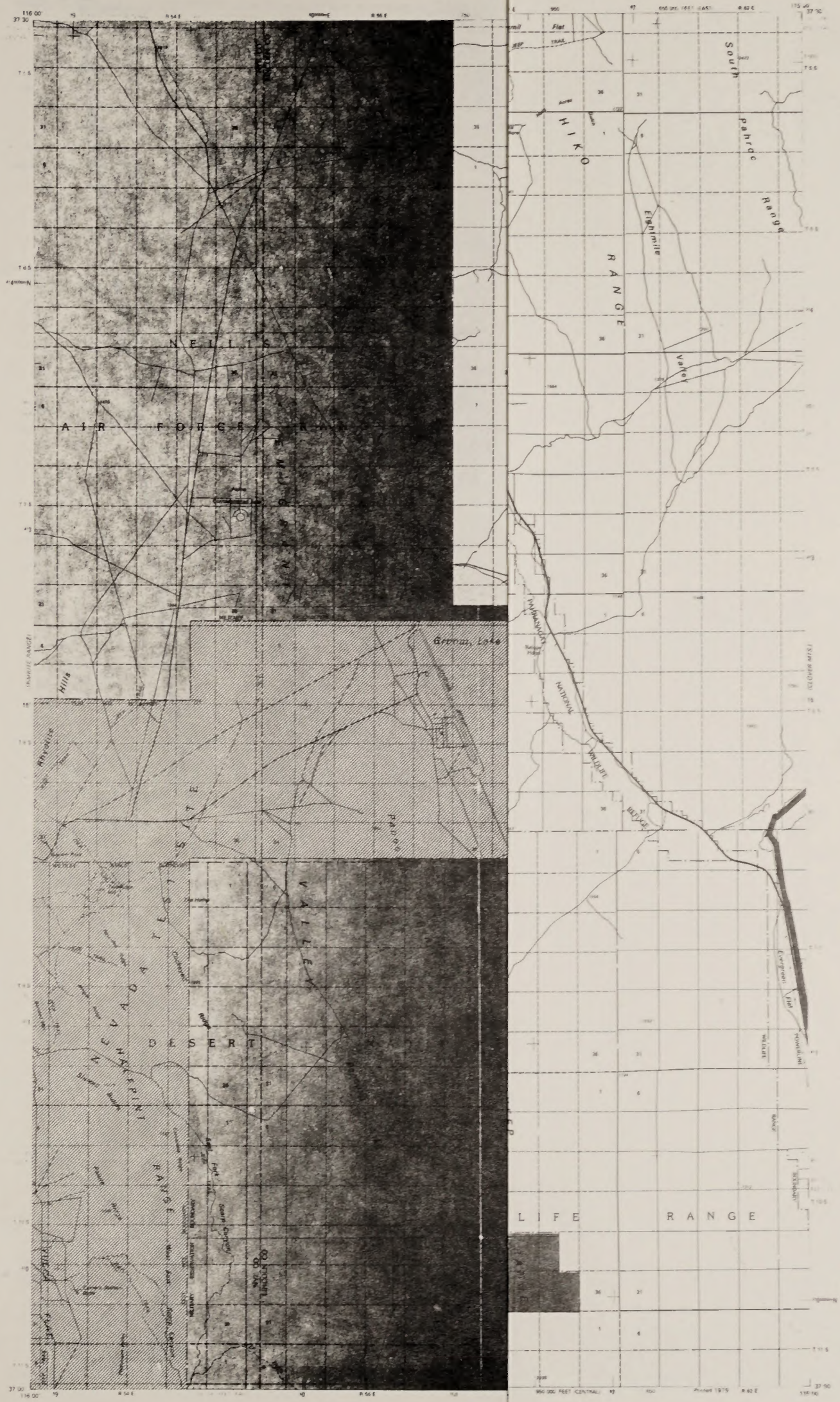
SCALE
1 0 1 2 3 4 5 miles

# -WILTEL-
# Fiber Optic Cable Right-of-Way

## Environmental Assessment

Project Route Map

Sheet 24 of 34



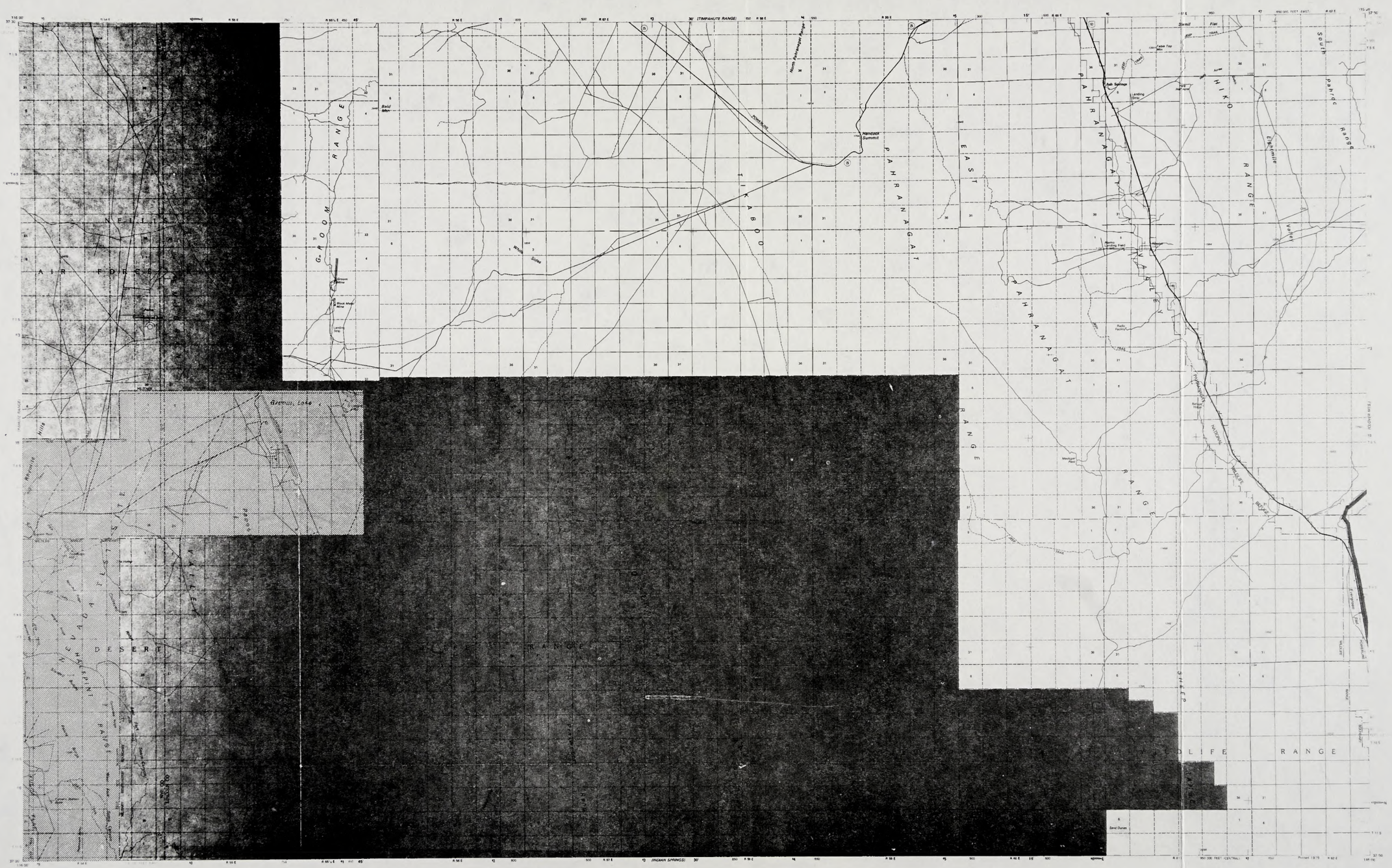

PAHRANAGAT RANGE, NV

REGENERATOR LOCATIONS

# -WILTEL-
## Fiber Optic Cable Right-of-Way
## Environmental Assessment

Project Route Map
Sheet 24 of 34

PAHRANAGAT RANGE, NV




REGENERATOR LOCATIONS

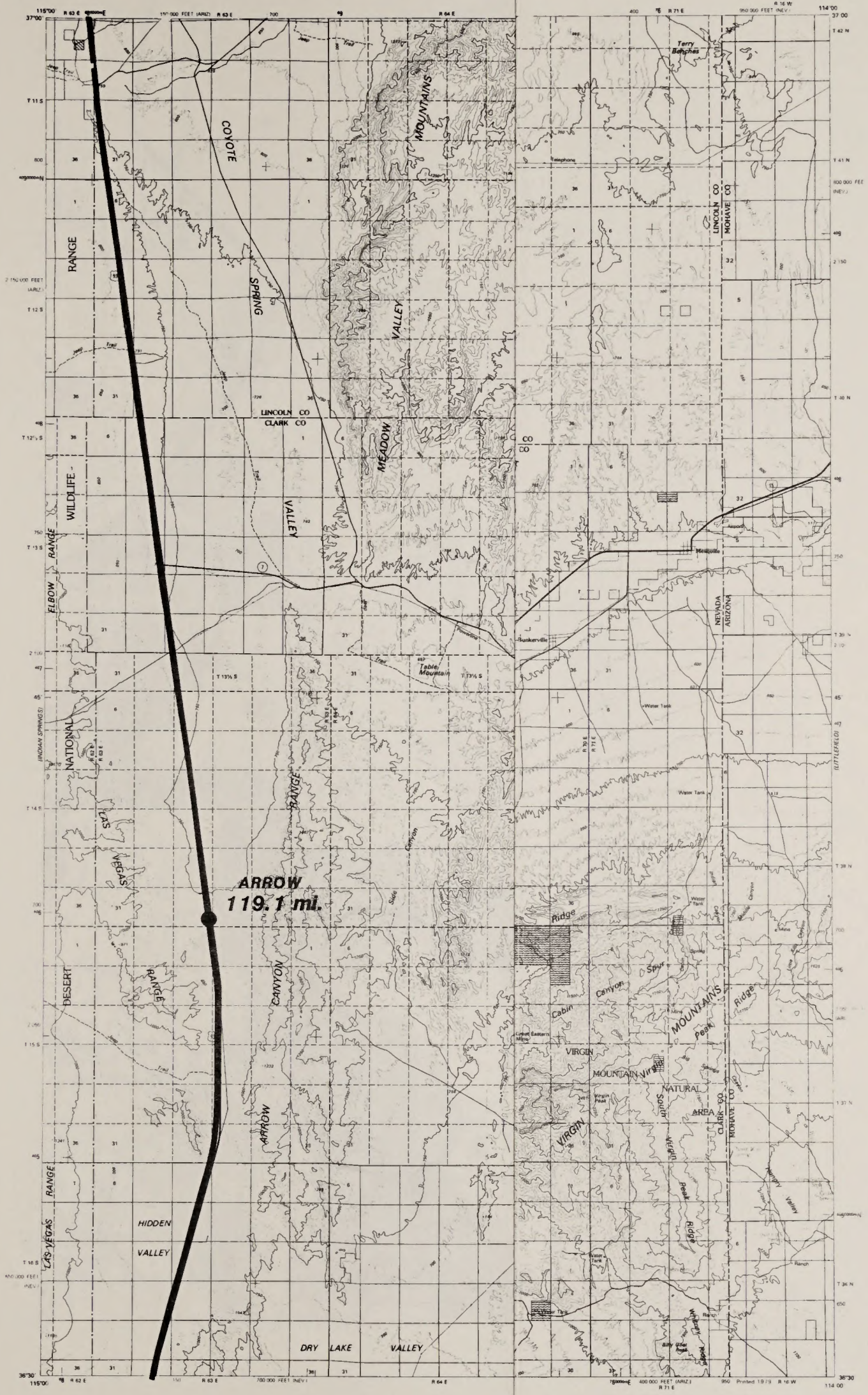
SCALE
1 0 1 2 3 4 5 miles

# -WILTEL-
# Fiber Optic Cable Right-of-Way
## Environmental Assessment

Project Route Map

Sheet **25** of **34**

OVERTON, NV




REGENERATOR LOCATIONS

# -WILTEL-
# Fiber Optic Cable Right-of-Way
## Environmental Assessment

Project Route Map
Sheet 25 of 34

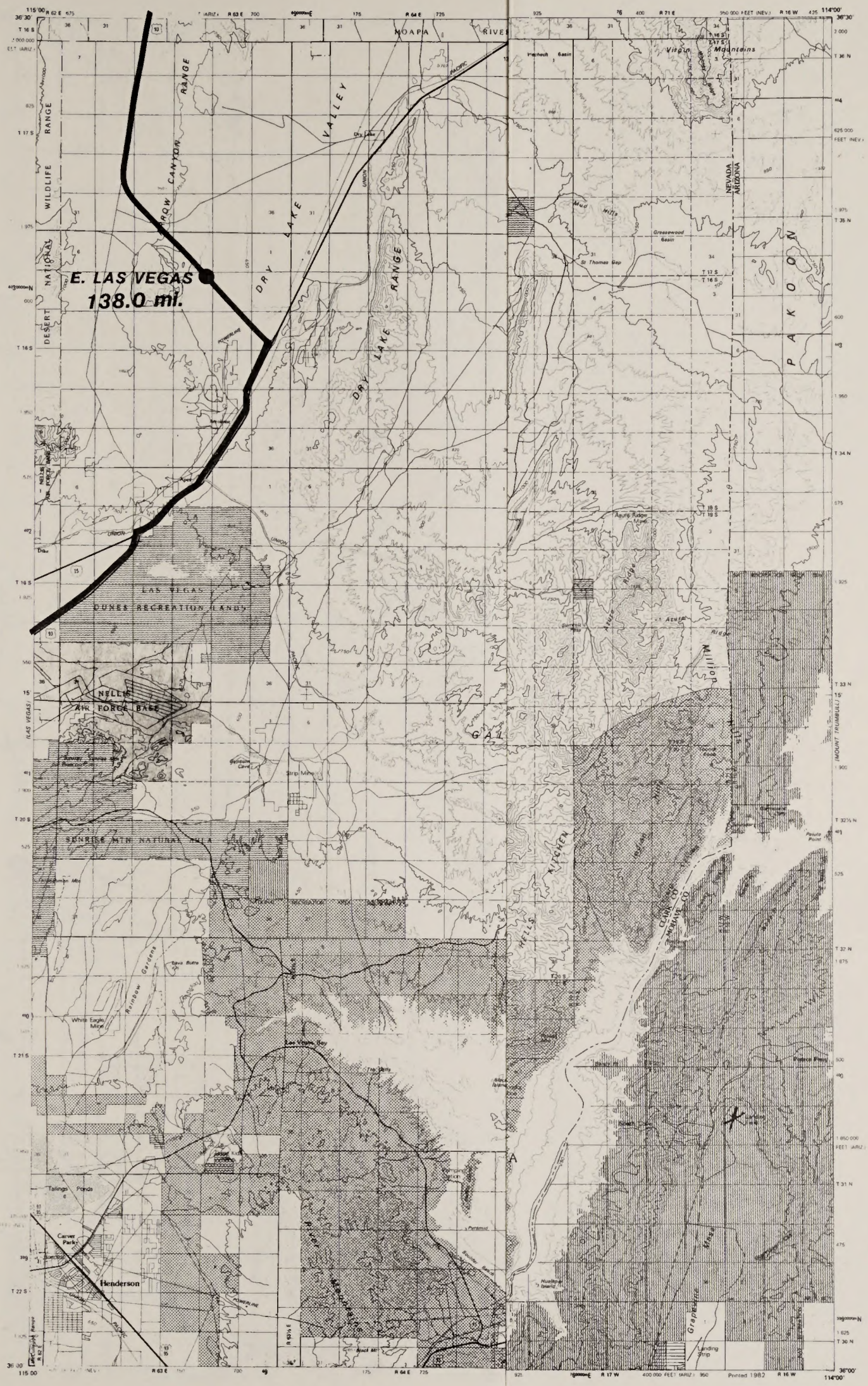
OVERTON, NV

REGENERATOR LOCATIONS

SCALE
1 0 1 2 3 4 5 miles

# -WILTEL-
# Fiber Optic Cable Right-of-Way
## Environmental Assessment

Project Route Map
Sheet 26 of 34



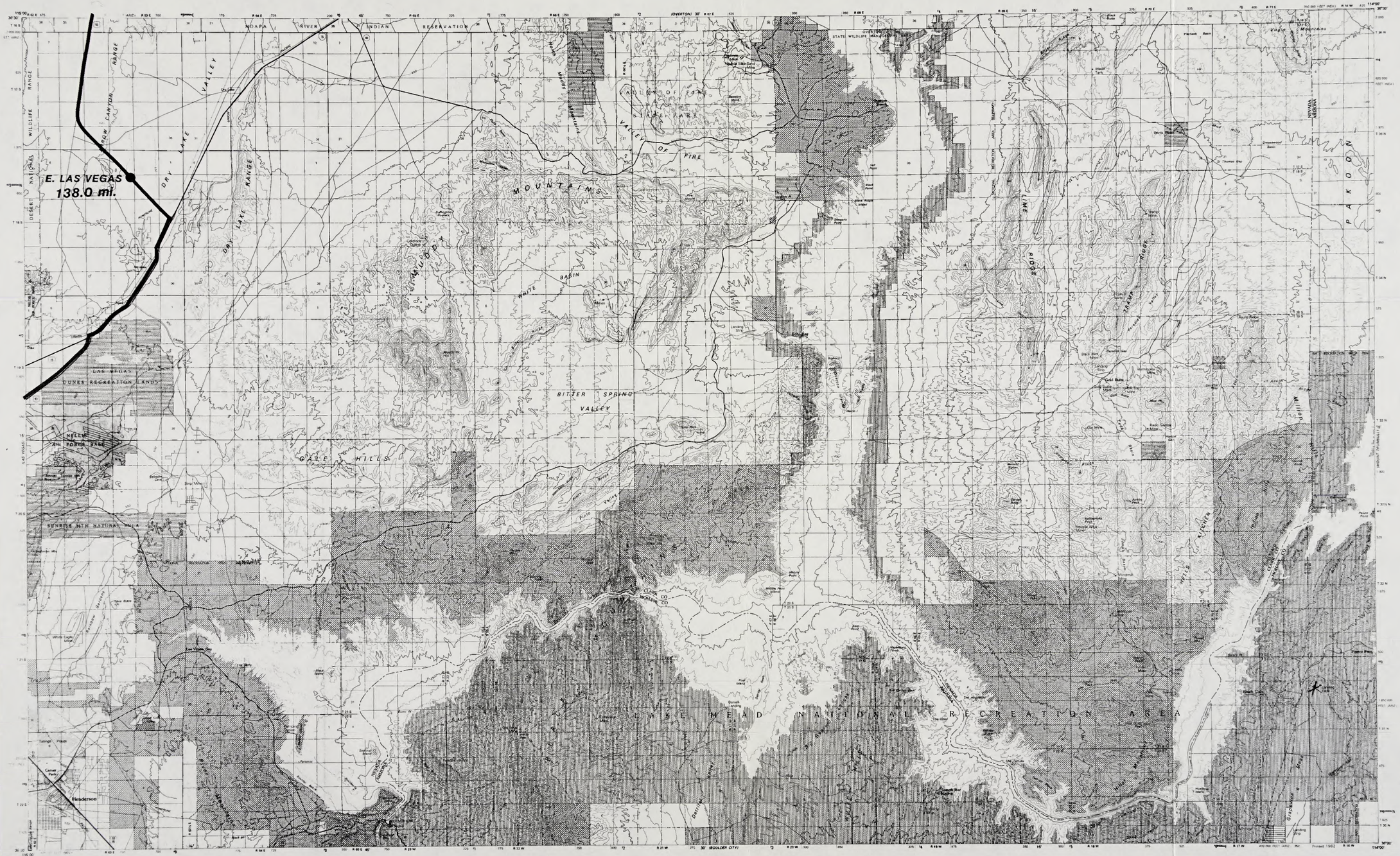

LAKE MEAD, NV

REGENERATOR LOCATIONS

# -WILTEL-
## Fiber Optic Cable Right-of-Way
## Environmental Assessment

Project Route Map
Sheet 26 of 34

LAKE MEAD, NV



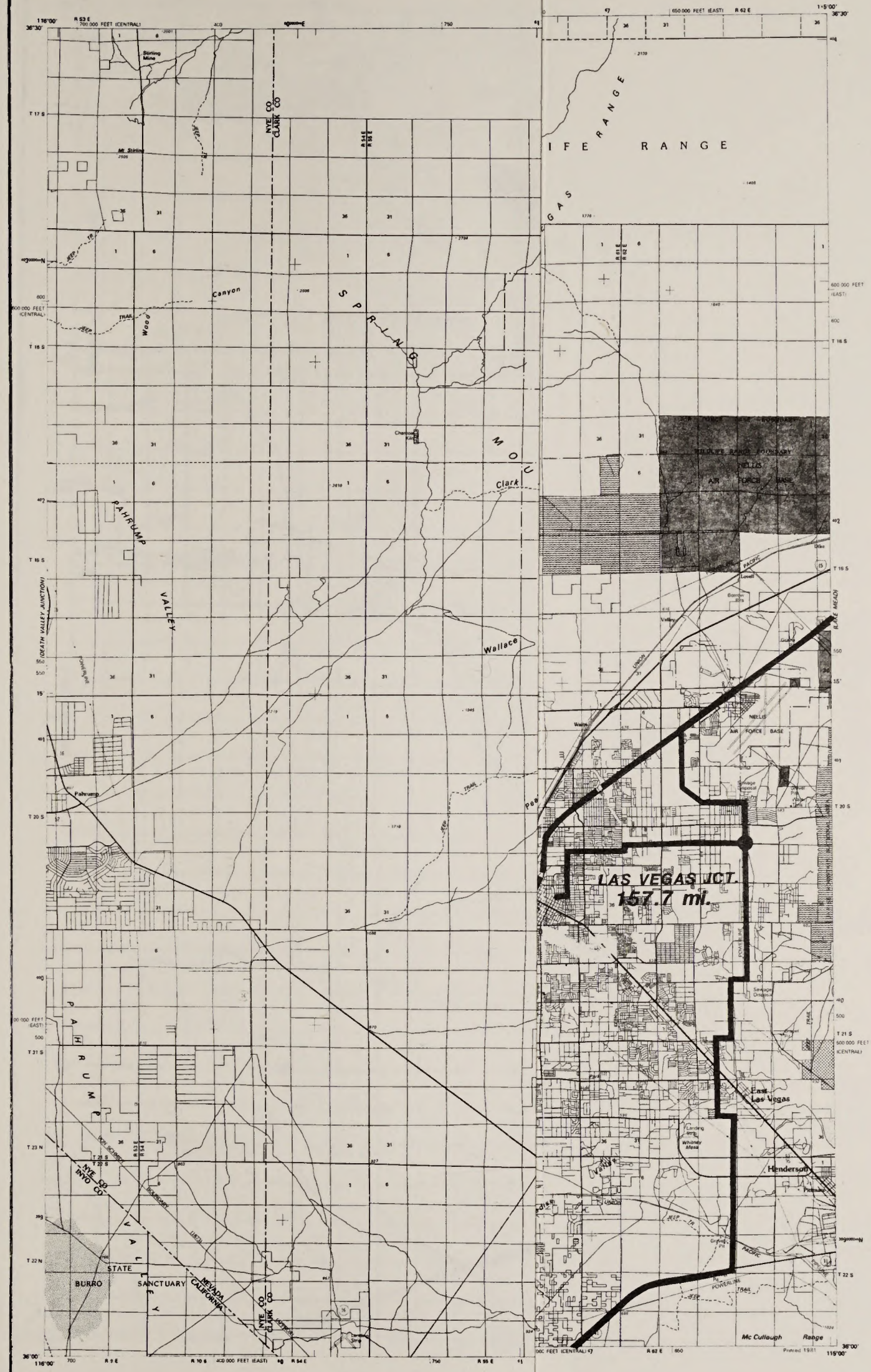

REGENERATOR LOCATIONS

SCALE
1 0 1 2 3 4 5 miles

# -WILTEL-
# Fiber Optic Cable Right-of-Way
## Environmental Assessment

Project Route Map
Sheet 27 of 34

LAS VEGAS, NV




REGENERATOR LOCATIONS

# -WILTEL-
# Fiber Optic Cable Right-of-Way
## Environmental Assessment

Project Route Map
Sheet 27 of 34

LAS VEGAS, NV

SCALE
1 0 1 2 3 4 5 miles

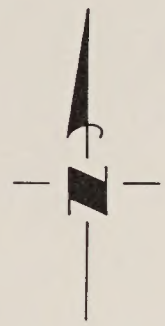
REGENERATOR LOCATIONS

# -WILTEL-
# Fiber Optic Cable Right-of-Way
## Environmental Assessment

Project Route Map

Sheet 28 of 34

MESQUITE LAKE, NV

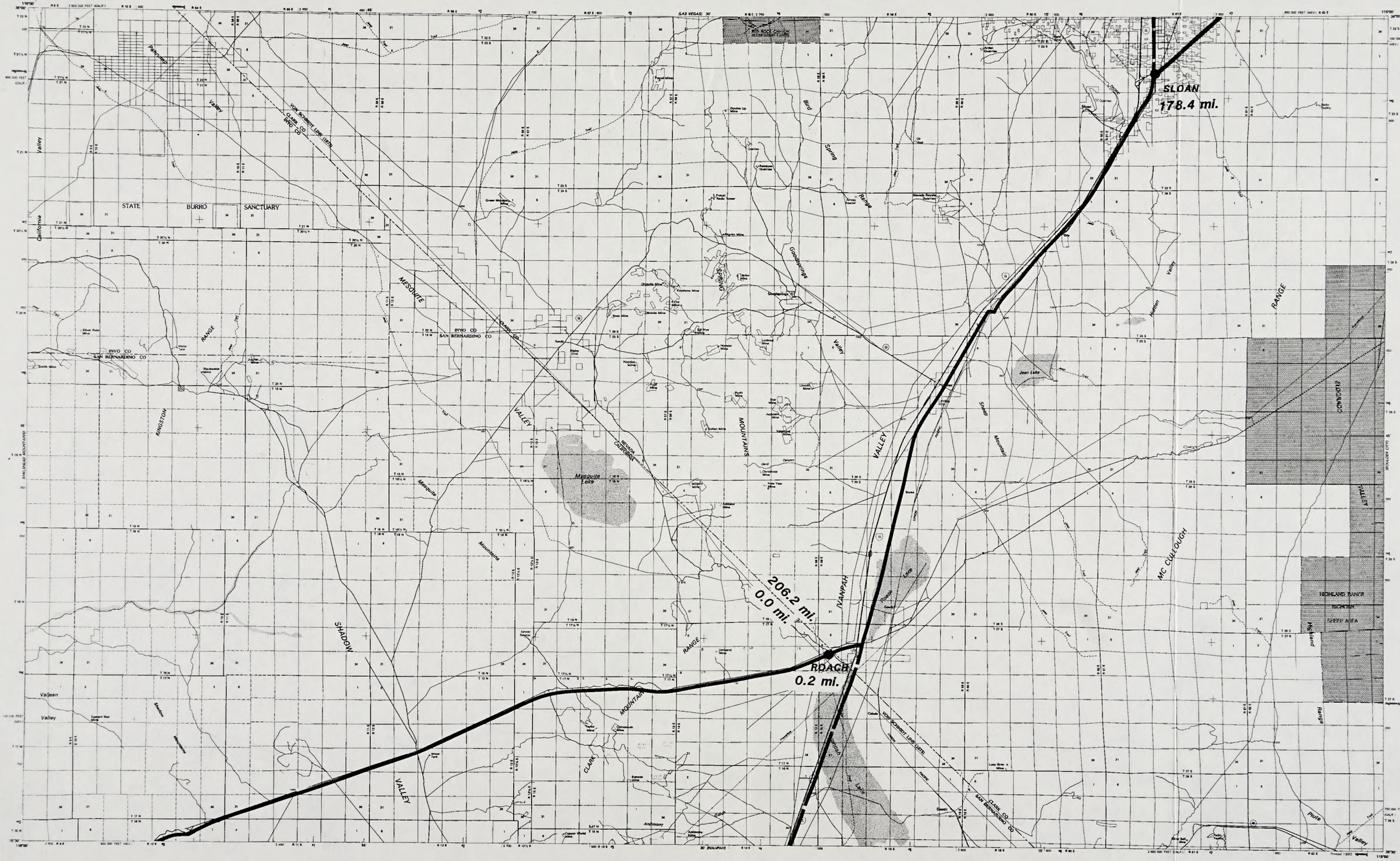


REGENERATOR LOCATIONS

# -WILTEL-
# Fiber Optic Cable Right-of-Way
## Environmental Assessment

Project Route Map
Sheet 28 of 34

MESQUITE LAKE, NV

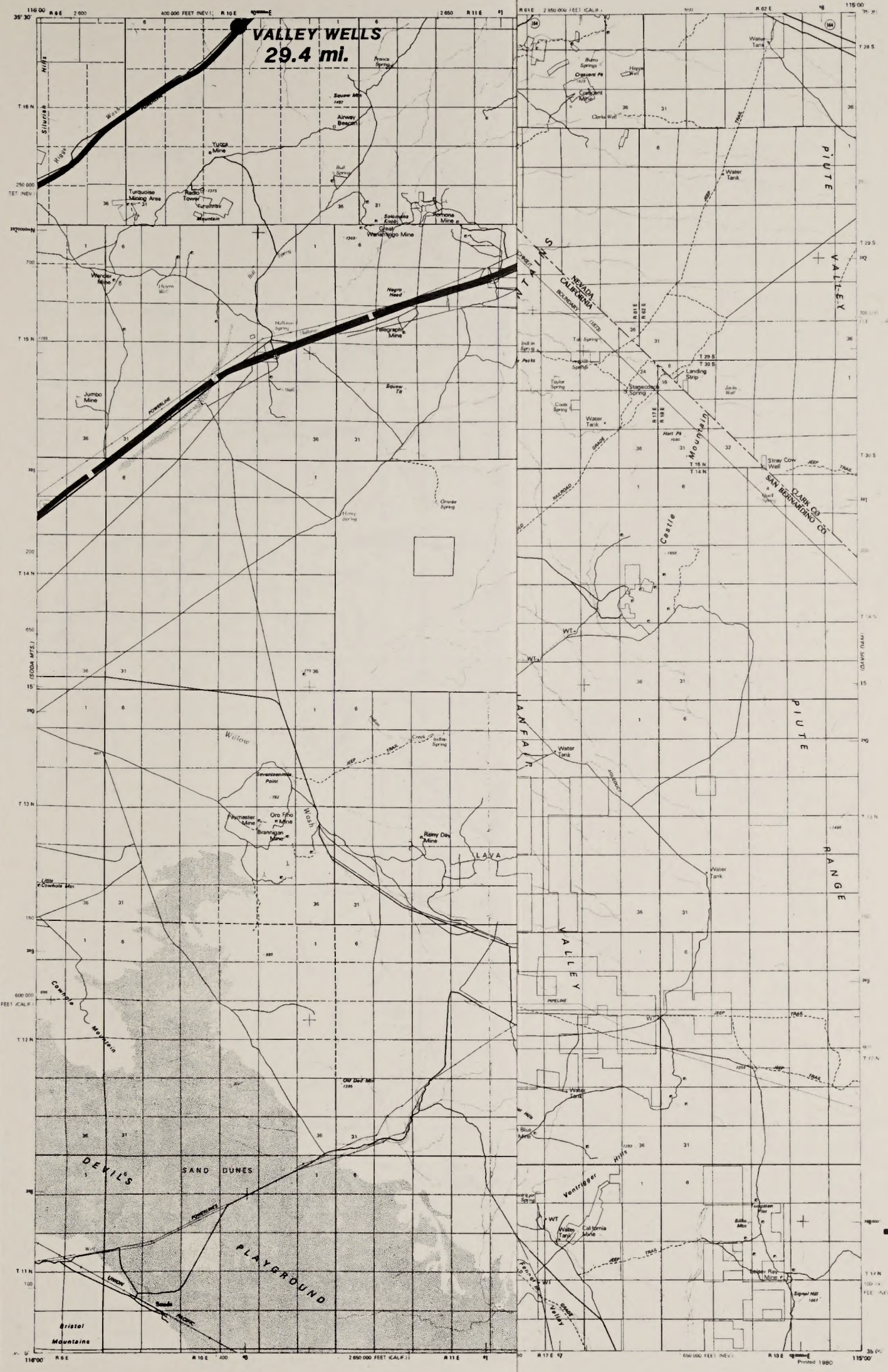

SLOAN
178.4 mi.
206.2 mi.
0.0 mi.
ROACH
0.2 mi.
STATE
BURRO
SANCTUARY
INYO CO
SAN BERNARDINO CO
CLARK CO
NEVADA
CALIFORNIA
MESQUITE LAKE
Mesquite
Valley
Shadow
Valley
Ivanpah
Valley
Clark
Mountain
Range
Kingston
Range
Spring
Mountains
Bird
Spring
Range
Goodsprings
Valley
Jean Lake
Sloan
Mountain
Hidden
Valley
Range
Eldorado
Boulder City
Highland
Range
Mc Cullough
Pass
Piute
Valley
Vallecito
Valley
Lanfair
Valley
Paradise
Valley
Valley
California
Valley
Vulcan
Mountain
Mountains
Providence
Mountains
Avawatz
Mountains
Kingston
Mountains
Nopah
Range
Resting
Spring
Range
Pahrump
Valley
Highland Range
Richmond
Green Area
Lanfair
Valley
Valley
Valley

# -WILTEL-
# Fiber Optic Cable Right-of-Way
## Environmental Assessment

Project Route Map

Sheet 29 of 34

IVANPAH, CA




REGENERATOR LOCATIONS

# -WILTEL-
# Fiber Optic Cable Right-of-Way
## Environmental Assessment

Project Route Map
Sheet 29 of 34

IVANPAH, CA

VALLEY WELLS
29.4 mi.

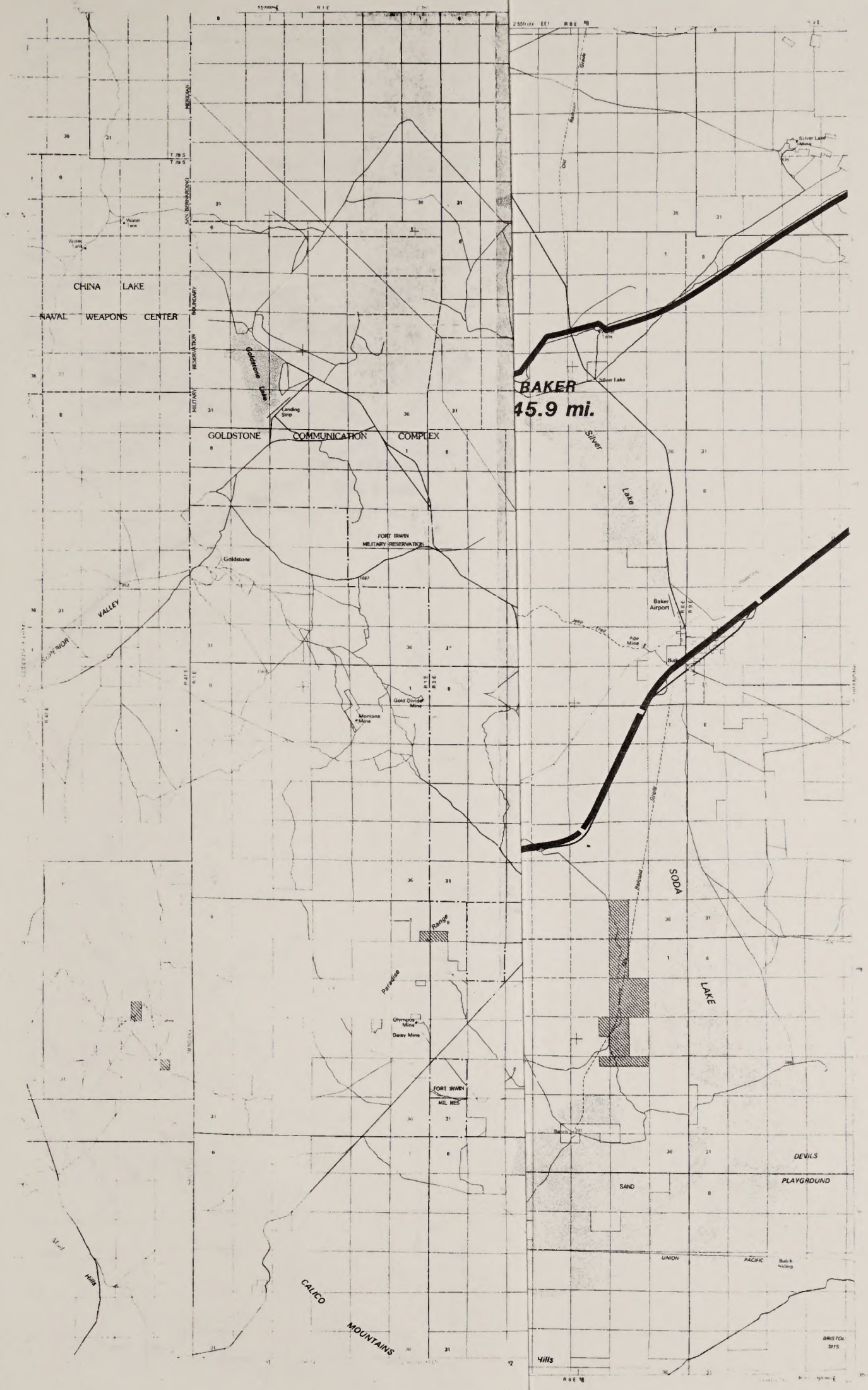
REGENERATOR LOCATIONS

SCALE
1 0 1 2 3 4 5 miles

# -WILTEL-
# Fiber Optic Cable Right-of-Way
## Environmental Assessment

Project Route Map
Sheet 30 of 34

SODA MTS., CA

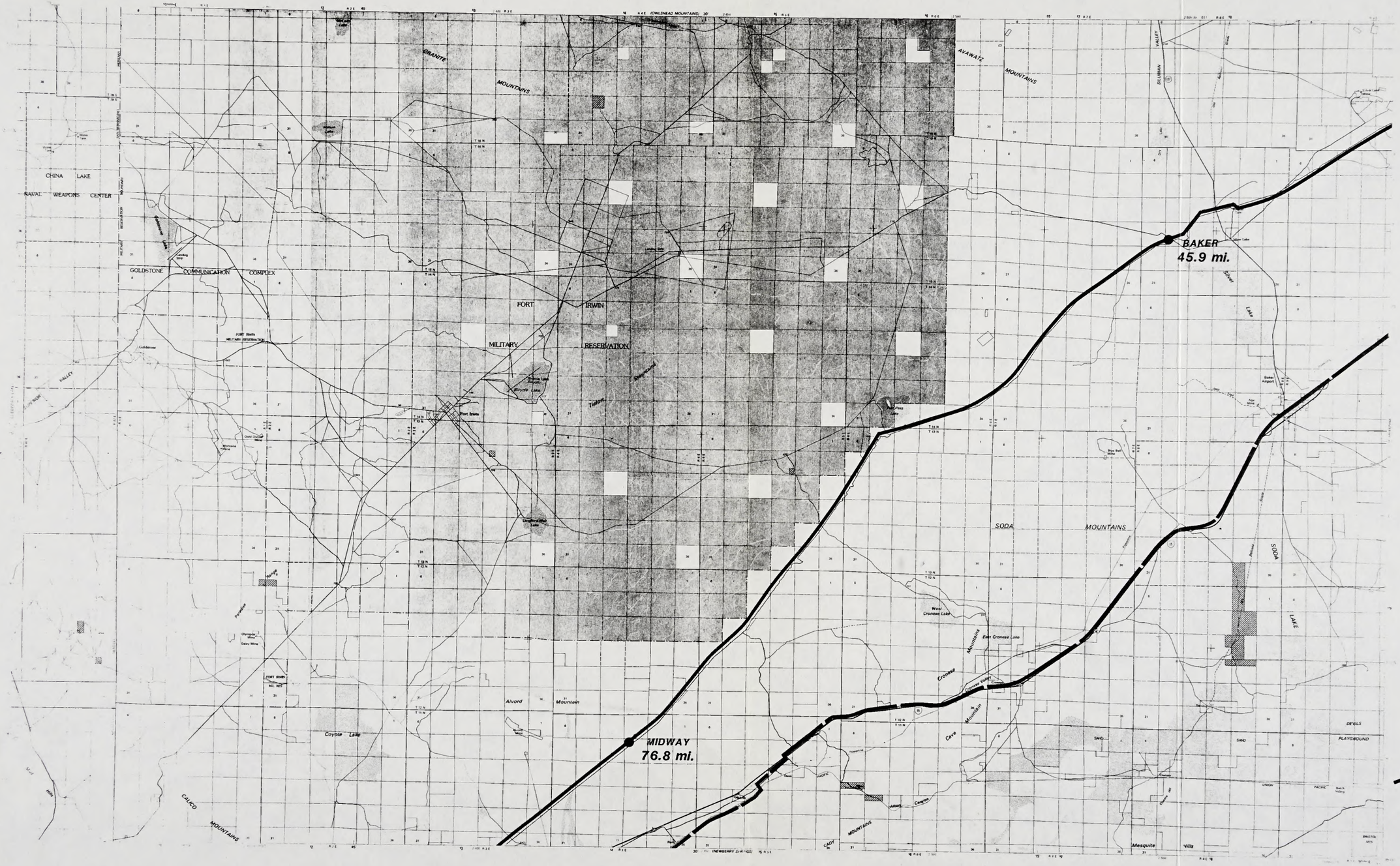



REGENERATOR LOCATIONS

# -WILTEL-
## Fiber Optic Cable Right-of-Way
## Environmental Assessment

Project Route Map
Sheet 30 of 34

SODA MTS., CA




REGENERATOR LOCATIONS

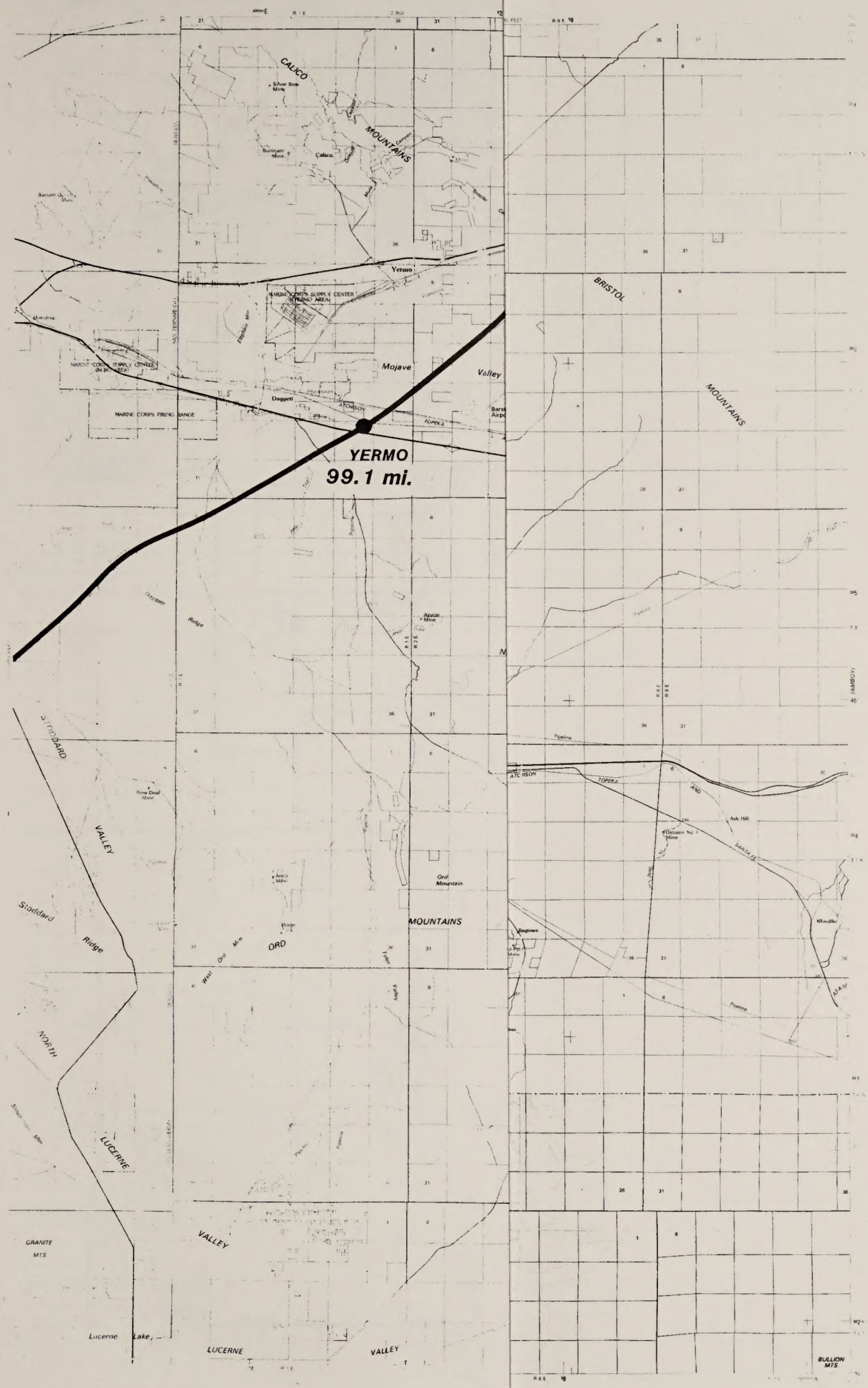
SCALE
1 0 1 2 3 4 5 miles

# -WILTEL-
# Fiber Optic Cable Right-of-Way
## Environmental Assessment

Project Route Map

Sheet 31 of 34

NEWBERRY SPRINGS, CA

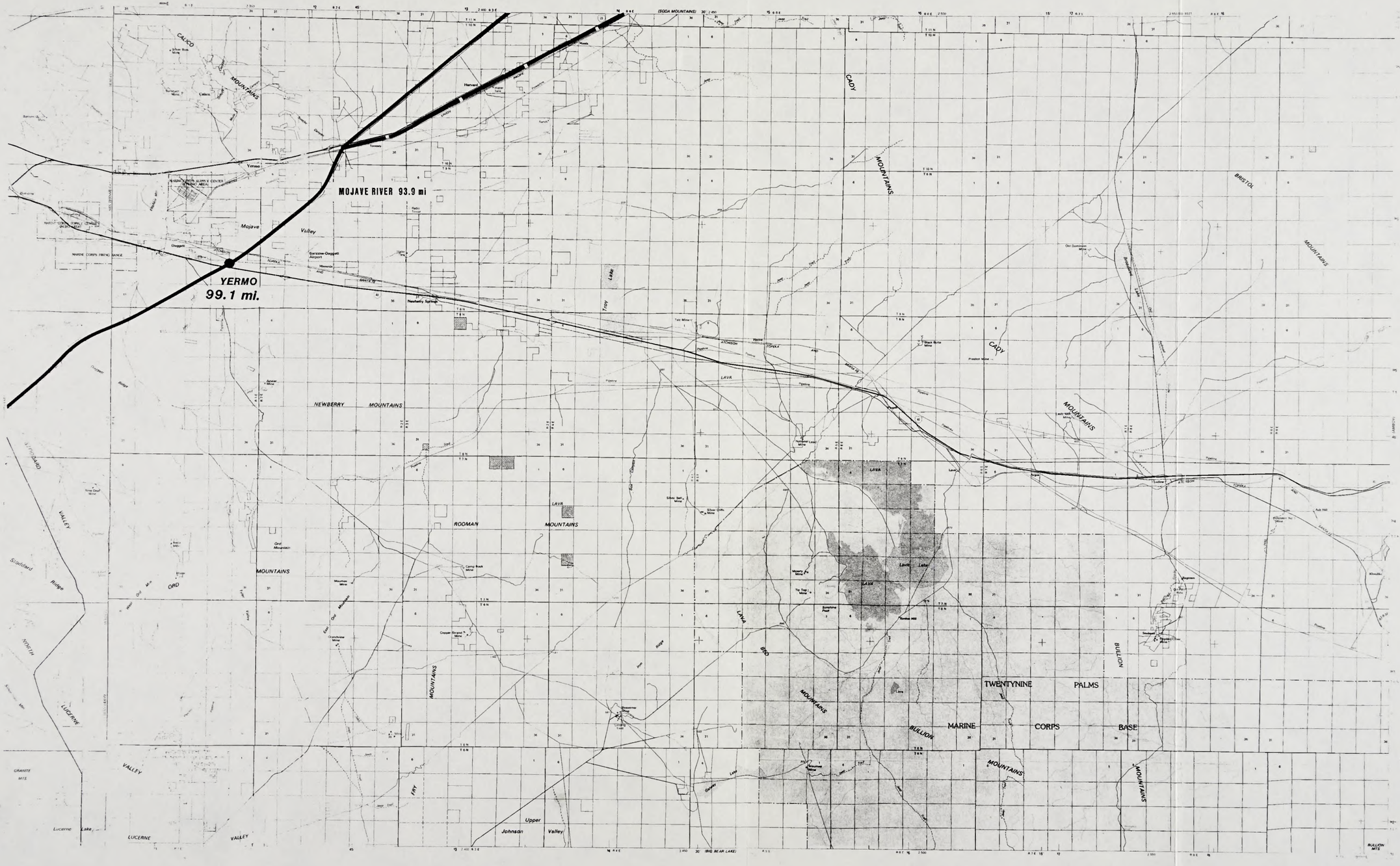



REGENERATOR LOCATIONS

# -WILTEL-
# Fiber Optic Cable Right-of-Way
## Environmental Assessment

Project Route Map
Sheet 31 of 34

NEWBERRY SPRINGS, CA




REGENERATOR LOCATIONS

SCALE
1 0 1 2 3 4 5 miles

# -WILTEL-
# Fiber Optic Cable Right-of-Way
## Environmental Assessment

Project Route Map
Sheet 32 of 34

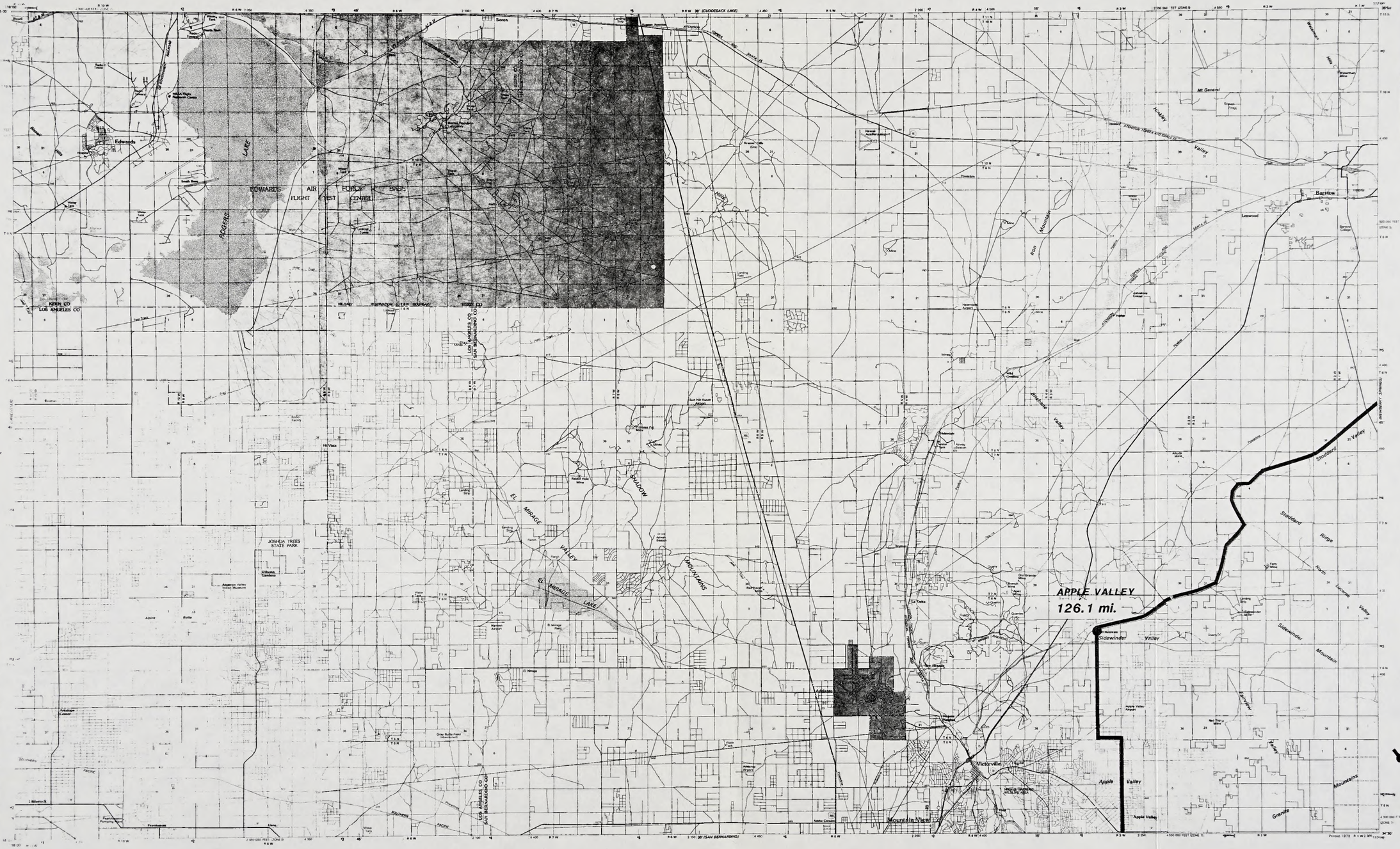
VICTORVILLE, CA

REGENERATOR LOCATIONS

# -WILTEL-
# Fiber Optic Cable Right-of-Way
## Environmental Assessment

Project Route Map
Sheet 32 of 34

VICTORVILLE, CA




REGENERATOR LOCATIONS

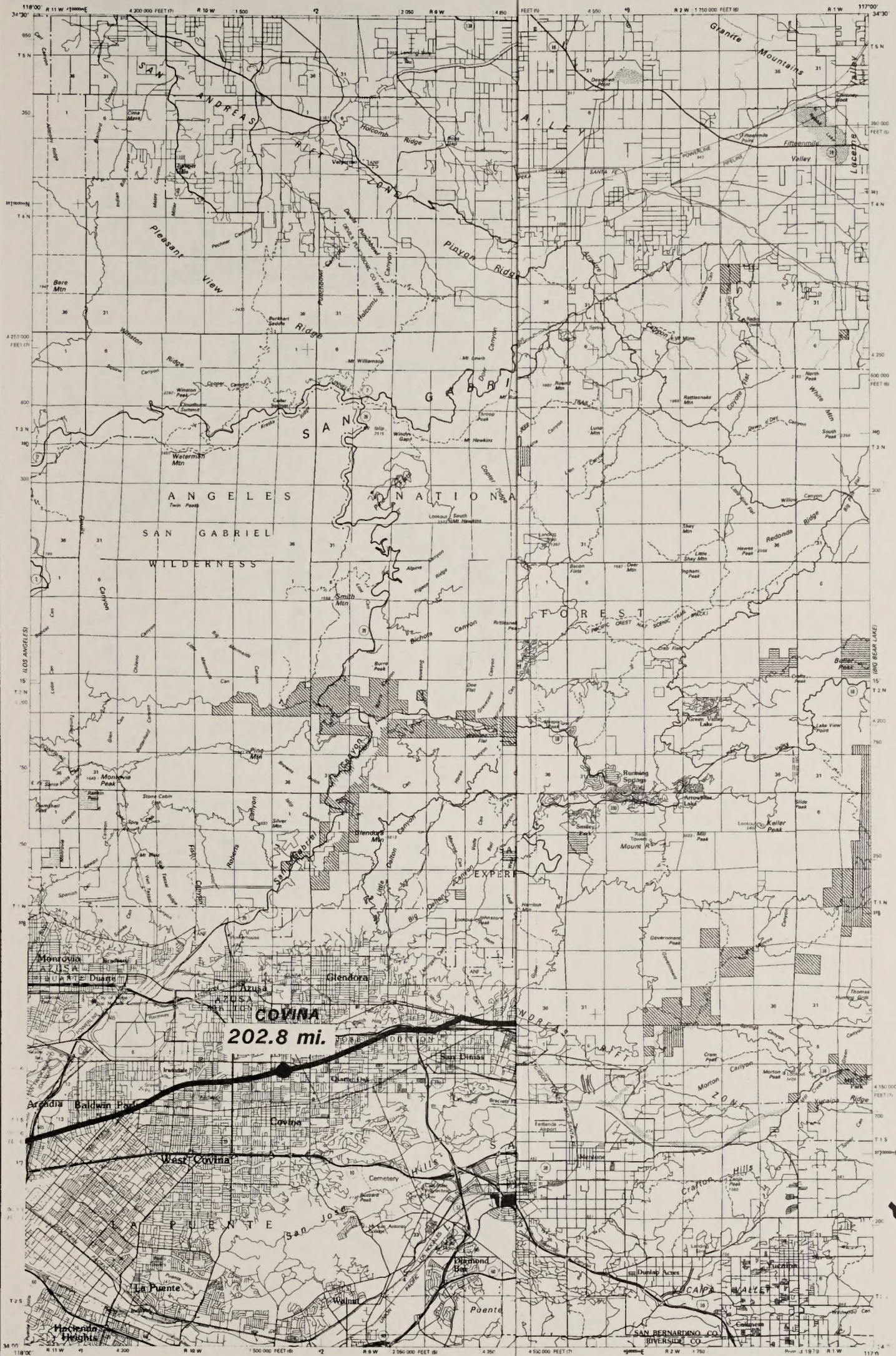
SCALE
1 0 1 2 3 4 5 miles

# -WILTEL-
# Fiber Optic Cable Right-of-Way
## Environmental Assessment

Project Route Map

Sheet 33 of 34

SAN BERNARDINO,CA

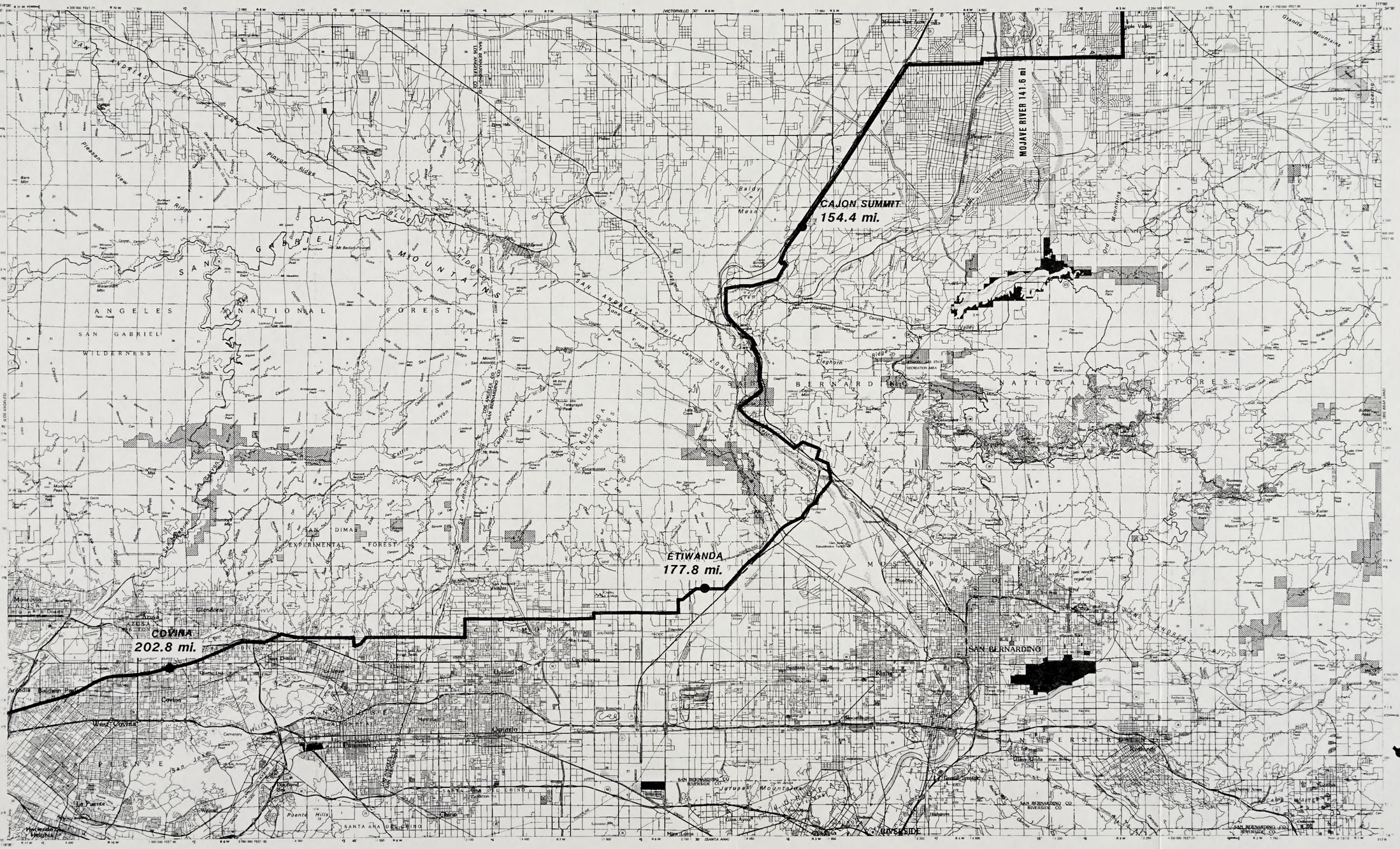



REGENERATOR LOCATIONS

# -WILTEL-
# Fiber Optic Cable Right-of-Way
## Environmental Assessment

Project Route Map
Sheet 33 of 34

SAN BERNARDINO,CA




REGENERATOR LOCATIONS

SCALE
1 0 1 2 3 4 5 miles

# -WILTEL-
# Fiber Optic Cable Right-of-Way
## Environmental Assessment

Project Route Map
Sheet 34 of 34

LOS ANGELES, CA

REGENERATOR LOCATIONS

**-WILTEL-**
**Fiber Optic Cable Right-of-Way**
**Environmental Assessment**
Project Route Map
Sheet 34 of 34

LOS ANGELES, CA

REGENERATOR LOCATIONS

SCALE
1 0 1 2 3 4 5 miles

# APPENDIX G

# GUIDELINES FOR THE PREPARATION OF THE CULTURAL RESOURCES INVENTORY CLASS I REPORT

APPENDIX G

GUIDELINES FOR THE PREPARATION OF THE
CULTURAL RESOURCE INVENTORY CLASS I REPORT

---

The following document outlines and describes the type of data, the data collection methods, procedure and sequence of events, and the deliverables required to complete a Class I Inventory of the cultural resources located along the proposed route of the fiber optic cable project of the Williams Telecommunications Company, in order to ensure compliance with Section 106 of the National Historic Preservation Act, as amended.

As presently proposed, the route passes through the following states and BLM districts represented by the Cultural Resource Specialist noted below:

Wyoming - Rawlins District: Mike Bies
Rock Springs District: Carmel Swidler and David Ulcek

Utah - Salt Lake City District: Douglas Dodge (Lead)
Cedar City District: Gardner Dalley
Richfield District: Craig Harmon

Nevada - Las Vegas District: Stan Rolf

California - Riverside District: Garth Portillo

The Salt Lake City District has been identified as the lead federal agency, and Douglas Dodge will act as the lead Cultural Resource Specialist. As understood from the meeting conducted on April 10, 1986, it will be the responsibility of Douglas Dodge to ensure consistency of

effort, requirements, and products among the participating BLM districts. However, the Class I report prepared for each state will be reviewed by the Cultural Resources Specialists of that state, and each state then will be responsible for securing an agreement that ensures compliance with Section 106 of the National Historic Preservation Act, as amended, with their respective State Historic Preservation Office. Opportunity for the Advisory Council on Historic Preservation to comment on the undertaking, agreements, and/or decisions concerning the project will be afforded through arrangements secured by the individual states.

As discussed at the meeting of April 10, the following sequence of events described herein will be undertaken to take into account the effect of the undertaking on historic properties and to ensure that compliance is achieved.

- Initial meeting to identify goals and event sequence (conducted in Salt Lake City, April 10, 1986).

- Initiation of Class I Inventory procedures by subcontractors; literature review and data collection to prepare statement for the Draft Environmental Assessment.

- Submission of the Draft Environmental Assessment, which will contain brief descriptions of the culture history specific to each state (derived from or cited to existing literature), brief statements in regard to the type and density of cultural resources that might be expected/encountered along the proposed right-of-way right-of-way, the potential effects of the project as proposed, reference to this agreement and the on-going Class I Inventory, and a review of potential and preferred mitigative procedures that may be required if National Register eligible properties of the types described are identified within the proposed right-of-way.

- Preparation of the draft Class I Inventory will include consultation with each district and/or resource area Cultural Resource Specialist to ensure that sensitive areas/properties have been identified, and that a management plan is developed which will be acceptable to the district/resource area specialist.

- Submission of the Class I Inventory report which will identify areas requiring Class III inventory and previously recorded properties, requiring ground-truthing; to be appended to the environmental assessment.

- Adoption of the Management Plan recommendations by the BLM and the SHPO, and initiation of the Class III inventory.

- Results of the Class III, and requirements found to be necessary as a result of that inventory will be appended to the individual Notices to Proceed generated by each of the seven districts.

CLASS I INVENTORY - SPECIFICATIONS

- Study Area: The study area is defined as 1320 feet (one-quarter mile) on each side of the proposed route center line. Within a one-quarter-mile area, (660 feet/one-eighth mile on each side of the proposed center line), site-specific data will be collected and presented for all cultural resources. Location of all sites within the one-quarter-mile study area on each side of the proposed center line will be mapped. In the event that a significant concentration of properties is known outside but in close proximity to a portion of the study area that is devoid of previously recorded properties, that concentration of sites will be discussed.

- Maps: In addition to report-size maps (8½x11" or 8½x14") to be included in the Class I Inventory Report text, a set of USGS topographical maps (7.5', 15'), on which are plotted all known historic and prehistoric sites within 0.5-mile-wide corridor centered on proposed route centerline will be submitted. Areal surveys within or overlapping the proposed route will also be reported.

# APPENDIX H

## LAND USE CATEGORIES CROSSED BY OR ADJACENT TO THE PROPOSED ROUTE

Table H-1. LAND USE CATEGORIES CROSSED BY OR ADJACENT TO THE PROPOSED ROUTE

| Land Use and Land Cover Category | Colorado Segment | Wyoming Segment | Utah Segment | Nevada Segment | California Segment |
|---|---|---|---|---|---|
| URBAN OR BUILT-UP | | | | | |
| - Residential | | X | X | X | X |
| - Commercial and services | | X | X | X | X |
| - Industrial | | X | | X | |
| - Transportation, communications, and utilities | | X | X | X | X |
| - Industrial and commercial complexes | | | | | |
| - Mixed urban or built-up | | X | X | X | |
| - Other urban or built-up | | X | X | X | X |
| AGRICULTURAL | | | | | |
| - Cropland and pasture | X | X | X | | |
| - Orchards, groves, vineyards, nurseries, and ornamental horticultural areas | | | | | |
| - Confined feeding operations | | | | | |
| - Other agricultural | | | X | | |
| RANGELAND | | | | | |
| - Herbaceous | X | X | | | |
| - Shrub and brush | | X | X | X | X |
| - Mixed | | X | X | | |
| FOREST | | | | | |
| - Deciduous | | | X | | |
| - Evergreen | | X | X | | |
| - Mixed | | | | | |
| WATER | | | | | |
| - Streams and canals | | | | | |
| - Lakes | | | | | |
| - Reservoirs | | | | | |
| - Bays and estuaries | | | | | |
| WETLAND | | | | | |
| - Forested | | X | | | |
| - Nonforested | | X | X | | |

Table H-1. LAND USE CATEGORIES CROSSED BY OR ADJACENT TO THE PROPOSED ROUTE (concluded)

| Land Use and Land Cover Category | Colorado Segment | Wyoming Segment | Utah Segment | Nevada Segment | California Segment |
|---|---|---|---|---|---|
| BARREN | | | | | |
| - Dry salt flats | | | | X | |
| - Beaches | | | | | |
| - Sandy areas other than beaches | | | | | |
| - Bare exposed rocks | | | | | |
| - Strip mines, quarries, and gravel pits | | X | X | X | |
| - Transitional areas | | X | | X | |
| - Mixed | | | | | |

Source: United States Geological Survey Land Use Maps.

# APPENDIX I

# TRANSMISSION LINES AND ACCESS ROADS

Table I-1. LOCATION AND LENGTHS OF NEW TRANSMISSION LINES AND ACCESS ROADS REQUIRED TO SERVE REGENERATOR STATIONS

| Regenerator Station | Location | | Length of New Transmission Line (Direction to Power Source) | Length of New New Access Road |
|---|---|---|---|---|
| | Milepost | Section/Towship Range | | |
| Cheyenne 24 | 0.0 | Sec 20 T12N R67W<br>Weld County, Colorado | None | None |
| Remont 25 | 15.8 | Sec 15 T13N R70W<br>Laramie County, Wyoming | None | None |
| Highway 287 26 | 41.2 | Sec 29 T15N R73W<br>Albany County, Wyoming | 0.25 Mile<br>(West) | None |
| Quealy Dome 27 | 64.2 | Sec 20 T17N R76W<br>Albany County, Wyoming | None | None |
| Arlington 28 | 82.9 | Sec 19 T19N R78W<br>Carbon County, Wyoming | None | None |
| Edson 29 | 114.2 | Sec 14 T21N R83W<br>Carbon County, Wyoming | None | None |
| Sinclair 30 | 128.0 | Sec 35 T21N R85W<br>Carbon County, Wyoming | 0.75 Mile | None |
| Riner Station 1 | 159.2 | Sec 34 T21N R90W<br>Carbon County, Wyoming | None | None |
| Wamsutter 2 | 182.0 | Sec 27 T20N R94W<br>Sweetwater County, Wyoming | None | None |
| Tipton Station 3 | 196.2 | Sec 8 T19N R96W<br>Sweetwater County, Wyoming | None | None |
| Rocky Point 4 | 225.2 | Sec 28 T20N R101W<br>Sweetwater County, Wyoming | None | None |

Table I-1. LOCATION AND LENGTHS OF NEW TRANSMISSION LINES AND ACCESS ROADS REQUIRED TO SERVE REGENERATOR STATIONS (continued)

| Regenerator Station | Location | | Length of New Transmission Line (Direction to Power Source) | Length of New New Access Road |
|---|---|---|---|---|
| | Milepost | Section/Towship Range | | |
| Rock Springs 5 | 254.2 | Sec 6 T18N R105W<br>Sweetwater County, Wyoming | None | None |
| Little America 6 | 281.7 | Sec 14 T18N R110W<br>Sweetwater County, Wyoming | 0.25 Mile<br>(West) | None |
| Church Butte 7 | 300.7 | Sec 35 T18N R113W<br>Uinta County, Wyoming | None | None |
| Union Station 8 | 321.2 | Sec 35 T16N R116W<br>Uinta County, Wyoming | None | None |
| Evanston Station 9 | 347.7 | Sec 28 T15N R120W<br>Uinta County, Wyoming | None | None |
| Trail Canyon Station 10 | 16.6 | Sec 10 T5N R5E<br>Morgan County, Utah | None | None |
| RTU #15 11 | 28.6 | Sec 20 T4N R4E<br>Morgan County, Utah | None | None |
| RTU #16 12 | 48.6 | Sec 27 T5N R1E<br>Morgan County, Utah | None | None |
| North Salt Lake | 71.4 | Sec 36 T2N R1W<br>Salt Lake County, Utah | None | None |
| Terminal Sub 1 | 80.9 | Sec 1 T1S R2W<br>Salt Lake County, Utah | None | None |
| Camp Williams 2 | 103.8 | Sec 22 T4S R1W<br>Salt Lake County, Utah | None | None |

Table 3-E. REDUCTION AND ELECTION OF NEW TRANSMISSION LINES AND ACCESS ROADS REQUIRED TO SERVE ALTERNATIVE STATIONS
(Continued)

| Replacement Station | Distance (miles) | Existing Township Lands (Line(s) Lost to Power Source) | Ownership of New Transmission Line | Length of New Line Access Road |
|---|---|---|---|---|
| Rock Springs 3 | 201.2 | See 4 T16N R106W<br>Sweetwater County, Wyoming | None | None |
| Platte Junction 6 | 201.2 | See 16 T7N R110W<br>Uinta County, Wyoming | [illegible] | None |
| Cheyenne Depot 7 | 200.7 | See 35 T12N R67W<br>Laramie County, Wyoming | None | None |
| Grand Junction 8 | 221.2 | See 20 T1S R103W<br>Mesa County, Colorado | None | None |
| Fruita Canyon Station 10 | 53.6 | See 10 T5N R97W<br>Mesa County, Utah | None | None |
| Rio Rio 11 | 26.8 | See 23 T4N R7E<br>Juab County, Utah | None | None |
| Rio Rio 12 | 26.8 | See 23 T4N R7E<br>Juab County, Utah | None | None |
| Apple Tree Lane | 73.4 | See 26 T5N R7E<br>Salt Lake County, Utah | None | None |
| Terminal Sub 1 | 60.3 | See 1 T1S R1W<br>Salt Lake County, Utah | None | None |
| Clay Bluffs 2 | 103.8 | See 22 T7S R7E<br>Juab County, Utah | None | None |

Table I-1. LOCATION AND LENGTHS OF NEW TRANSMISSION LINES AND ACCESS ROADS REQUIRED TO SERVE REGENERATOR STATIONS (continued)

| Regenerator Station | Location | | Length of New Transmission Line (Direction to Power Source) | Length of New New Access Road |
|---|---|---|---|---|
| | Milepost | Section/Towship Range | | |
| Fairfield 3 | 126.8 | Sec 1 T7S R3W<br>Utah County, Utah | 2 Miles<br>(East) | None |
| Tintic 4 | 155.8 | Sec 27 T10S R3W<br>Tooele County, Utah | None | None |
| Lynndyl 5 | 183.9 | Sec 30 T14S R4W<br>Juab County, Utah | 2 Miles | None |
| Delta 6 | 199.8 | Sec 34 T16S R6W<br>Millard County, Utah | None | None |
| P. T. Mountain 7 | 221.2 | Sec 23 T19S R8W<br>Millard County, Utah | None | None |
| Black Rock 8 | 245.8 | Sec 16 T23S R9W<br>Millard County, Utah | 0.5 Mile<br>(Northwest) | None |
| Milford North 9 | 275.1 | Sec 32 T27S R10W<br>Beaver County, Utah | None | None |
| Milford South 10 | 289.1 | Sec 35 T29S R11W<br>Beaver County, Utah | None | None |
| Lund 11 | 312.6 | Sec 11 T32S R14W<br>Iron County, Utah | None | None |
| Beryl 12 | 330.3 | Sec 33 T33S R16W<br>Iron County, Utah | None | None |
| Modena 13 | 349.2 | Sec 36 T34S R19W<br>Iron County, Utah | None | None |

Table I-1. LOCATION AND LENGTHS OF NEW TRANSMISSION LINES AND ACCESS ROADS REQUIRED TO SERVE REGENERATOR STATIONS (continued)

| Regenerator Station | Location | | Length of New Transmission Line (Direction to Power Source) | Length of New New Access Road |
|---|---|---|---|---|
| | Milepost | Section/Towship Range | | |
| Panaca 14 | 18.9 | Sec 9 T2S R68E<br>Lincoln County, Nevada | None | None |
| Burnt Springs 15 | 41.0 | Sec 29 T2S R65E<br>Lincoln County, Nevada | None | None |
| Delamar Wash 16 | 62.6 | Sec 12 T6S R63E<br>Lincoln County, Nevada | None | None |
| Butler Ranch 17 | 89.6 | Sec 13 T10S R62E | None | None |
| Arrow 18 | 119.1 | Sec 33 T14S R63E<br>Clark County, Nevada | None | None |
| East Las Vegas 19 | 138.0 | Sec 10 T18S R63E<br>Clark County, Nevada | 300 Feet<br>(West) | None |
| Las Vegas Jct | 157.7 | Sec 22 T20S R62E<br>Clark County, Nevada | None | None |
| Sloan | 178.4 | Sec 9 T23S R61E<br>Clark County, Nevada | None | None |
| Roach | 0.2 | Sec 7 T17N R15E<br>San Bernardino County, California | 0.9 Mile | None |
| Valley Wells | 29.4 | Sec 4 T16N R10E<br>San Bernardino County, California | 2.9 Miles<br>(South) | None |
| Baker | 45.9 | Sec 20 T15N R8E<br>San Bernardino County, California | 11.7 Miles<br>(South) | None |

Table 2-12. LOCATION AND DENSITY OF NEW TUBERCULOSIS CLINICS AND ACCESS ROADS SERVING TO SERVE RESERVATION STATIONS
(Continued)

| Reservation Stations | Clinics (Nearest Service Center) | Length of New Transmission Line (Direction to Power Source) | Length of New Two Access Road |
|---|---|---|---|
| Owyhee IA | 180.9 | Dec 3 [illegible] Elko County, Nevada | None |
| Owyhee Springs IA | 63.9 | Dec 29 [illegible] Lincoln County, Nevada | None |
| Paiute Wells IA | 63.9 | Dec 13 [illegible] Lincoln County, Nevada | None |
| Pauley Creek IA | 80.9 | Dec 13 [illegible] Clark County, Nevada | None |
| San Luis Obispo IA | 130.0 | Dec 10 [illegible] Clark County, Nevada | 300 Feet (New) |
| Las Vegas IA | 167.7 | Dec 27 [illegible] Clark County, Nevada | None |
| Other | 170.4 | Dec 3 [illegible] Clark County, Nevada | None |
| Other | [illegible] | Dec 1 [illegible] San Bernardino County, California | 6.7 Mile |
| Pauley Creek | 20.4 | Dec 4 [illegible] San Bernardino County, California | 2.3 Miles (Dirt) |
| Other | 80.9 | Dec 30 [illegible] San Bernardino County, California | 11.1 Miles (Dirt) |

Table I-1. LOCATION AND LENGTHS OF NEW TRANSMISSION LINES AND ACCESS ROADS REQUIRED TO SERVE REGENERATOR STATIONS (concluded)

| Regenerator Station | Location | | Length of New Transmission Line (Direction to Power Source) | Length of New New Access Road |
|---|---|---|---|---|
| | Milepost | Section/Towship Range | | |
| Midway | 76.8 | Sec 10 T11N R4E<br>San Bernardino County, California | 0.5 Mile<br>(Northwest) | None |
| Vermo | 99.1 | Sec 26 T9N R1E<br>San Bernardino County, California | 0.8 Mile | None |
| Apple Valley | 126.1 | Sec 21 T6N R3W<br>San Bernardino County, California | None | None |
| Cajon Summit | 154.4 | Sec 8 T3N R5W<br>San Bernardino County, California | None | None |
| Etiwanda | 177.8 | Sec 22 T1N R6W<br>San Bernardino County, California | 0.8 Mile<br>(Southwest) | None |
| Covina | 202.8 | Sec 12 T1S R10W<br>San Bernardino County, California | None | None |
| Los Angeles | 219.3 | - | - | - |

BUREAU OF LAND MANAGEMENT LIBRARY
BLDG. 50,
DENVER FEDERAL CENTER
P.O. BOX 25047
DENVER, COLORADO 80225